9. NO-ACTION ALTERNATIVE

9.1 Technical Issues

9.1 (138)
Comment - 13 comments summarized
Commenters said that the No-Action analysis is inadequate and does not provide a basis for comparison with the Proposed Action. Some of the reasons stated include: the existence of large uncertainties, lack of information, and failure of DOE to quantify how uncertainties could affect the outcome of the analysis; the use of a regional approach instead of a site-by-site approach, without providing data that shows it is truly representative; the use of different assumptions related to conservatism between the analysis of the Proposed Action and the No-Action Alternative; the need to look at a scenario that includes some redistribution or centralizing of the waste as a possible outcome of no action on the repository; and failure to consider the potential value of the waste.

Several commenters stated that a more comprehensive analysis on a site-by-site basis would demonstrate that a geologic repository would be favorable.

Response
DOE analyzed the No-Action Alternative to serve as a basis for comparing the magnitude of potential environmental impacts of the Proposed Action. Under the No-Action Alternative, and consistent with the NWPA, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate any significant adverse environmental impacts. In addition, DOE would prepare a report to Congress, with the Department's recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage at the generator sites, commercial utilities and DOE would have to continue managing spent nuclear fuel and high-level radioactive waste in a manner that protected public health and safety and the environment. However, the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain was not approved is uncertain.

DOE recognizes that a number of possibilities could be pursued, including continued storage of spent nuclear fuel and high-level radioactive waste at existing sites and/or one or more centralized locations, study and selection of another location for a deep geologic repository (Chapter 1 identifies the process and alternative sites previously selected by DOE for technical study as potential repository locations), the development of new technologies (for example, transmutation), or reconsideration of alternatives to geologic disposal. The environmental considerations of these possibilities have been analyzed in other contexts in other documents to varying degrees.

The No-Action Alternative did not consider redistribution or centralizing of spent nuclear fuel. However, the introduction to Chapter 7 of the EIS lists several references to documents that have evaluated potential environmental impacts of away-from-reactor spent nuclear fuel consolidation facilities. In addition, because the Department believes that it is a reasonably foreseeable future action although still uncertain, the Final EIS includes an evaluation of potential cumulative transportation impacts associated with the shipment of 40,000 metric tons of heavy metal (MTHM) of commercial spent nuclear fuel to a proposed privately owned centralized storage facility at Skull Valley in Utah (see Chapter 7 and Section 8.4 for details).

In light of these uncertainties, DOE decided to illustrate the possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios—long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years (Scenario 1), and long-term storage with no effective institutional control after about 100 years (Scenario 2). Although the Department agrees that neither of these scenarios is likely, it selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur.

In addition, because the purpose of the No-Action Alternative is to provide a basis for comparison with the Proposed Action, DOE has tried to be consistent with the analyses of the Proposed Action, as appropriate. Regarding long-term analyses, for example, Section K.1 of the EIS notes that DOE did not want to influence the results to favor the

Proposed Action, and thus used assumptions for the No-Action Alternative that minimized predicted impacts. The Department believes that the avoidance of overstatement of impacts is the conservative approach for evaluation of potential impacts from the No-Action Alternative. Section K.4 discusses examples of these assumptions and their effects on the outcome of the impact analyses. Based on the above, DOE believes that the environmental impacts of the No-Action Alternative discussed in Chapter 7 and Appendix K are not overstated.

In Section K.4.4 of the EIS, DOE acknowledges that the No-Action Alternative impacts presented in Chapter 7 and Appendix K could be much larger or smaller than those estimated for the EIS. DOE believes that these estimates (with their uncertainties) adequately describe the potential environmental impacts that could occur from continued storage of high-level radioactive waste and spent nuclear fuel at or near existing facilities, and are valuable to the decisionmaking process.

Chapter 7 and Appendix K of the EIS provide information related to the No-Action Alternative. In addition, the 16 references cited in the No-Action impact analysis provide additional detailed information.

DOE analyzed five "regionalized" sites based on regional environmental parameters. DOE selected and weighted these parameters based on each site's potential for human health impacts (that is, inventory, facility failure rates, canister corrosion rates, surface-water pathways to humans, and downstream populations). DOE evaluated site-specific environmental conditions, such as freeze-thaw cycles, precipitation frequency and quantities, precipitation chemistry, and relative humidity, at the 77 storage locations to determine failure times for the primary weather protection barriers (see Section K.2.1.1 of the EIS). For above-ground concrete storage facilities, these failure times ranged from fewer than 75 years for areas with many freeze-thaw cycles and abundant precipitation, such as the Northeast, to more than 600 years in dry, warm areas, such as the desert Southwest. For the below-grade storage facilities (such as those at the Savannah River Site and Hanford), the Department assumed that the primary weather protection would fail at 50 years after maintenance ended because, unlike the reinforced concrete structures used in above-ground facilities, the below-grade facilities use sheet-metal buildings. Release of radioactive materials would not begin with the loss of weather protection but only after the weather protection was lost and the storage canister and or cladding failed (see Section K.2.1). In addition, DOE gathered operational data obtained from facilities currently in operation or planned for the near future (see Appendix K of the EIS). The analysis constructed and evaluated the five hypothetical sites in a manner such that the total collective impacts estimated for a given region would be essentially equal to those that would have been estimated using individual, site-specific analyses.

Because the potential value of spent nuclear fuel and high-level radioactive waste would be the same under the Proposed Action and the No-Action Alternative, DOE does not consider it to be an important discriminator in the decisionmaking process and, therefore, did not include the value in either analysis.

9.1 (162)
Comment - 2 comments summarized
Commenters stated that a reliance on the Nuclear Regulatory Commission's prior analysis conducted for independent spent fuel storage installations as a basis for characterizing long-term at-reactor storage is not appropriate.

Response
The Nuclear Regulatory Commission (DIRS 101899-NRC 1996) has stated, "The overall conclusion for on-site storage of spent fuel during the term of a renewed license is that the environmental impacts will be small for each plant." Although this finding is applicable only to the continued storage of existing spent nuclear fuel and spent nuclear fuel generated during the 20-year license renewal period for a nuclear powerplant, for purposes of analysis, DOE assumed that potential environmental and radiological impacts for the storage facility would remain small for much longer periods assuming effective institutional controls are maintained. Environmental impacts would remain small because no additional fuel would be generated beyond the operation of the nuclear powerplant (plants are assumed to be closed after the first 20-year license renewal period), and radiological impacts would remain within regulatory limits specified in the storage facility license (10 CFR Part 72).

9.1 (250)
Comment - 20 comments summarized
Commenters suggested that the Supplement to the Draft EIS should have considered aging spent nuclear fuel and high-level radioactive at the generator sites rather than at the repository site. The commenters suggested several benefits of generator-site aging which included reduced transportation risks (incident-free and accidents), reduced health and safety risks (for both routine operations as well as accident consequences) and expenses related to the proposed repository spent nuclear fuel aging facility, and providing additional time for development of new management technologies as well as scientific research and review of currently proposed disposal technologies. Other commenters suggested that storage of fuel at existing sites for up to 100 years for the purpose of cooling would be a more realistic No-Action Alternative than abandoning the spent nuclear fuel at the reactor sites for 10,000 years. Commenters suggested that the interim storage facilities could be used to age the spent nuclear waste.

Response
The commenters are correct in saying that, as spent nuclear fuel and high-level radioactive waste age, their radioactivity decreases. DOE recognizes that delaying the shipment of these materials for 50 years could reduce radiation exposures to transportation workers (truck drivers and handlers) and the public living along the transportation routes. However, because of the generally higher population densities near the generator sites, delaying shipment to the proposed repository and allowing the material to accumulate at generator sites or nearby interim storage facilities could increase potential overall impacts to current and future generations of individuals living and working in and around the storage facilities. Section 7.2.1.7.3 of the EIS contains information on the effects of delayed shipment indicating that most short-term impacts from the continued storage of spent nuclear fuel and high-level radioactive waste (about 15 latent cancer fatalities) would result from exposure to noninvolved workers working near the storage facilities during the first 50 years of storage. Implementation of the Proposed Action would avoid much of this exposure. Under a delayed shipping scenario, such exposures would be additive to the somewhat reduced exposures to workers and the public resulting from the later transportation of spent nuclear fuel and high-level radioactive waste to the repository. Thus, a significant reduction in collective impacts, including those resulting from a smaller repository surface aging facility, under a delayed shipping scenario or near-site interim storage would be unlikely.

Similarly, reductions in potential impacts resulting from transportation (both accidents and incident-free transport) of "representative" fuel (see Appendix A) evaluated in Chapter 6 of the EIS or for routine operations or accidents at the repository evaluated in Chapter 4 would not be offset by the potential impacts of 50 to 100 years of additional storage at the generator sites of more than 16 latent cancer fatalities (see Section 7.2.1.7.3).

Socioeconomic impacts related to extended emplacement periods are discussed in Section 3.1.6 of the Supplement to the Draft EIS and 4.1.6 of the Final EIS. However, as discussed in Section 5.2.4.1 of the Draft EIS, DOE accepts the position of the National Academy of Sciences that it is not possible to make accurate predictions of future human behavior. As stated in Section 5.2.4.1 of the Draft EIS, DOE used a default position of today's conditions. For the Final EIS, DOE has projected baseline population and other economic measures to 2035. Because much of the aging process occurs outside of the timeframe for which socioeconomic impacts can reasonably be predicted (2035), the estimated impacts are generalized and confined to direct employment estimates. In addition, projections for periods further in the future would be substantially less credible and for this reason, have not been included in the analysis.

With regard to comments suggesting that onsite aging would be a more realistic No-Action Alternative, although not specifically evaluated, DOE believes that potential impacts related to onsite aging would be similar to the short-term impacts estimated for the No-Action Alternative, which assumes that the spent nuclear fuel would remain on the site for 100 years (see Section 7.2.1.7.3). DOE believes that licensed onsite dry storage facilities demonstrate the practicality and feasibility, and thus the reasonableness, of the No-Action scenarios. In addition, DOE believes the two No-Action Alternative scenarios evaluated in this EIS reflect a range of impacts that could occur and, therefore, provide an adequate basis for comparison of impacts resulting from the Proposed Action.

The Proposed Action includes a lengthy program of monitoring and testing that would continue for perhaps more than 300 years after waste emplacement ended (through closure of the repository, as described in Section 2.1.2 of the EIS). It would give future decisionmakers the ability to take advantage of technological advances, implement corrective actions, if required, and make societal choices on closing the repository or retrieving the wastes.

However, even if new technologies become feasible sometime in the future, the Department believes that a repository would continue to be an essential element of the nuclear fuel cycle because significant quantities of highly radioactive, long-lived materials would remain unsuitable for treatment. Therefore, the Department does not recommend abandoning the Nation's current waste management strategies.

9.1 (292)
Comment - EIS000026 / 0003
Under the No-Action Alternative, if the Department of Energy decides not to proceed with the development of a repository at Yucca Mountain, one alternative will be the continued storage of the materials at their present locations. The EIS considered two scenarios in this event: long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years and long-term storage with no institutional controls after approximately 100 years. A number of considerations were taken into account under these scenarios. However, from Florida's standpoint, the risks from possible hurricanes on stored spent nuclear fuel and high-level radioactive waste were not considered appropriately in either scenario.

Response
The Nuclear Regulatory Commission licenses spent nuclear fuel storage facilities at commercial nuclear generating sites (such as those in Florida) under 10 CFR Part 72. License requirements include extensive safety analyses that consider the impacts of plausible accident-initiating events (including natural phenomenon such as earthquakes, tornadoes, lightning, hurricanes, floods, tsunami, and seiches). These analyses must demonstrate that the facilities can withstand the most severe wind loading (tornado winds and tornado-generated missiles) and flooding from the Probable Maximum Hurricane with minimal release of radioactive material. DOE has revised Section 7.2.1.8 of the EIS to reflect these requirements.

Chapter 7 of the EIS describes an analysis DOE performed to identify types of events (natural and manmade) that could lead to the release of radioactive material to the environment. The analysis found no such events. However, it did determine that two events would be the most challenging to the integrity of a licensed and maintained storage facility -- the crash of an aircraft and a severe seismic event (see Section 7.2.2.7).

The analysis assumed that the facilities would be licensed and maintained during the period of active institutional control (the first 100 years of Scenarios 1 and 2 and the remaining 9,900 years of Scenario 1) and, therefore, that they would be able to withstand maximum postulated hurricanes. Under Scenario 2, during the period without institutional control (100 to 10,000 years), there would be no maintenance so the facilities would eventually degrade to a point where protection from hurricanes would not be effective. If a hurricane struck a degraded facility, a release of radioactive materials could occur earlier than predicted (see Section K.2 of the EIS) because of damage to the engineered barriers (concrete storage modules, dry storage canisters, material cladding, etc.). Section K.4 describes the potential effect of early loss of these barriers, which could result in significantly greater collective impacts than those discussed in Sections 7.2.1.7.3 and 7.2.2.5.3. However, because of the large uncertainties involved with trying to predict the outcome, and because DOE did not want to overestimate the impacts of the No-Action Alternative, the analysis made no attempt to quantify potential impacts from future severe weather phenomena.

9.1 (2043)
Comment - EIS001660 / 0006
The DEIS is confusing and misleading with regards to future generation of SNF [spent nuclear fuel] and HLW [high-level radioactive waste]. When discussing the no-action alternative, the DEIS says that all nuclear power plants will be closed by 2116 (p. 7-28), that decommissioning will occur in 2052 (p. 7-29), and that nuclear power plants would be closed after the first 20-year licensing renewal period (pp. 7-43 and -44). The cumulative impact analysis considers SNF generated until the year 2046, and says that Modules 1 and 2 represent "all" projected SNF and HLW (p. 8-5). No such statements are made regarding the proposed action.

If the DOE proposes to close all commercial nuclear power plants by a certain year, this must be explicitly stated as part of the proposed action. If not, both the proposed action and the no-[action] alternative must consider SNF and HLW generated after that year. Presently, the analysis of the proposed action does not account for 35,000 tons of SNF and HLW generated through 2046, over and above 70,000 tons that would be placed at Yucca Mountain. Nor

does the DEIS account for SNF and HLW generated after 2046. Because of these errors, the DEIS greatly underestimates the costs of the proposed action. (See Table 2-5.)

Response
DOE recognizes that some existing nuclear facilities could be shut down prematurely and that others could be relicensed more than once. However, for purposes of analysis, the Department used certain simplifying assumptions to evaluate potential impacts of the No-Action Alternative. Important among these are the assumption that the No-Action Alternative would begin in 2002 (Sections 2.2.2 and 7.2 of the EIS), that some commercial nuclear powerplants would continue to operate through the first 20-year licensing renewal period (Section 7.3), and that noninvolved workers (powerplant workers) would remain at the generating facilities until 2052 (Section 7.2.1.7.3). These assumptions established a basis for analysis of the No-Action Alternative and are not predictions of actual events or proposals for future action.

The NWPA specifically restricts the capacity of the Nation's first repository to no more than 70,000 metric tons of heavy metal of spent nuclear fuel and high-level radioactive waste. Therefore, DOE limited the impact evaluation of the Proposed Action to those that could result from the emplacement of 70,000 metric tons of heavy metal. However, disposing of all commercial and DOE spent nuclear fuel and all high-level radioactive waste projected through 2046 (Module 1) as well as Greater-Than-Class-C low-level radioactive waste and Special-Performance-Assessment-Required waste (Module 2) in the repository represents a reasonably foreseeable future action. For this reason, DOE analyzed the potential impacts for these actions as potential cumulative impacts (Chapter 8).

For consistency, the No-Action Alternative analysis also evaluated the potential environmental impacts from continued onsite storage of all commercial and DOE spent nuclear fuel and all high-level radioactive waste projected through 2046. Section 7.3 of the EIS discusses the results of these analyses.

Regarding evaluation of commercial spent nuclear fuel generated after 2046, DOE believes that generation rates after the first licensing renewal period are too speculative to predict. Therefore, the analyses did not evaluate these potential impacts for either the Proposed Action or the No-Action Alternative.

9.1 (3637)
Comment - EIS001105 / 0001
While it is recognized that the no-action alternative be addressed, it is acknowledged that the judged consequences are highly speculative and that the actual impact of no action could well be many times greater than that presented in the draft. A particular example is the "sealed source" waste described in Appendix A Section A.2.5.3. The assumption that this material will always be placed in standard waste packages is unrealistic. Thus, the no-action case underestimates the potential for its deterioration, with resultant releases of actinides. Such releases would seriously multiply the consequences of the no-action case to both human mortality and environmental contamination throughout the DOE/commercial sites and their environments across the entire country.

Response
The assumption that DOE would place sealed-source waste in standard waste packages applies only to disposal of these wastes at the proposed Yucca Mountain Repository, as discussed in Chapter 8 of the EIS.

As stated in Section 7.3 of the EIS, DOE did not include a quantitative evaluation of Module 2 inventory potential impacts under the No-Action Alternative because not enough information is available about the long-term storage configuration of the sealed sources under that alternative.

9.1 (3959)
Comment - EIS001486 / 0001
Missing under the No-Action Alternative is No-Generation. This would cut loses due to the predicted increment in waste as well as to an accidental increment as aging generators become short-timers.

Response
DOE has no authority over the operation of the Nation's commercial nuclear powerplants. As mandated by the Atomic Energy Act, the Nuclear Regulatory Commission has jurisdictional authority for commercial uses of nuclear

materials, including the operation of reactors to produce electricity; this includes the production of electricity from nuclear energy and the interim storage of spent nuclear fuel at the reactor sites.

9.1 (4101)
Comment - EIS001375 / 0005
The "No Action" alternative leaves the waste in storage facilities at reactor sites that were never intended to become permanent storage sites. Although on-site dry cask storage has been determined by the NRC to be safe for a limited amount of time, waste should not be stored on-site indefinitely. There are 11 active commercial nuclear reactors in Illinois and 3 retired commercial reactors. These sites are all near major population centers and/or Illinois waterways.

Response
By including long-term onsite storage as part of the No-Action Alternative, DOE is not predicting conditions that would actually occur. In fact, the Department recognizes that both No-Action Alternative scenarios are unlikely (see Section 2.2 and the introduction to Chapter 7 of the EIS). However, the Department selected these scenarios to provide a basis for comparison to the Proposed Action and because they reflect a range of potential impacts that could occur from the continued storage of material at these sites.

If the Yucca Mountain site was not approved, DOE would discontinue the development of a repository at Yucca Mountain and, as directed by Section 113(c)(3) of the NWPA, would prepare a report to Congress with its recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Based on Nuclear Regulatory Commission regulations and DOE directives that govern the safe and secure storage of spent nuclear fuel and high-level radioactive waste, commercial and DOE sites have an obligation to continue to manage these materials in a manner that protects public health and safety and the environment.

9.1 (4260)
Comment - EIS001160 / 0075
Page 1-20. Failure to provide institutional control over this sensitive and potentially dangerous material (provided governmental agencies concerned with this still exist) is poor logic. Perhaps the DOE could consider alternatives in the range between 100 and 10,000 years. Other parts of the document discuss permanent closure after 300 years. This appears inconsistent with other statements in the document.

Response
DOE recognizes that maintaining effective institutional control for 10,000 years is unlikely, as is losing effective institutional control after 100 years (see Section 2.2 and Chapter 7 of the EIS). The Department selected these scenarios because it did not want to speculate on actions that Congress, DOE, and the utilities could take if Yucca Mountain was not approved as a repository site and because predicting a date for a loss of institutional control would be speculative. The Nuclear Regulatory Commission and the Environmental Protection Agency have recognized this and, although they encourage the maintenance of monitoring and physical oversight for as long as possible, they recognize that projecting society's willingness and ability to provide such a function for more than 100 years into the future is not reasonable. DOE selected these scenarios to provide a basis for comparison of impacts from the Proposed Action and to reflect a range of impacts that could occur if spent nuclear fuel and high-level radioactive waste were left where they are currently stored.

DOE believes that efforts to perform additional analyses, such as institutional control for 300 years, probably would yield results that contained some combination of the environmental and human health effects postulated for the two scenarios evaluated in the EIS and, therefore, would not provide substantive additional information for the decisionmakers.

9.1 (4272)
Comment - EIS001160 / 0080
Page 2-1: The second paragraph notes that the No Action Alternative is intended to serve as a baseline against which the Proposed Action can be evaluated. Because waste managed on-site at generator locations has institutional controls, the No Action assumption of loss of institutional controls is not a true reflection of baseline conditions.

Response
Because the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain did not receive a recommendation as a repository site is uncertain (see the introduction to Chapter 7 of the EIS), DOE decided to illustrate one set of possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios: long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years (Scenario 1), and long-term storage with no institutional control after approximately 100 years (Scenario 2). DOE recognizes that neither of these scenarios would be likely to occur but selected them for analysis because they reflect a range of potential impacts that could occur. The Department evaluated Scenario 1 to estimate potential impacts under the status quo: continuing to store spent nuclear fuel and high-level radioactive waste with institutional control. Scenario 2 provides another set of potential impacts if the responsible organizations became unable or unwilling to continue to fund surveillance and maintenance of the storage facilities. DOE selected Scenario 2 to parallel that part of the Proposed Action analysis in which long-term performance does not include institutional controls.

9.1 (4279)
Comment - EIS001160 / 0087
Page 2-59: The No-Action Alternative should be recognized as more than simply "providing a baseline for comparison." In fact, DOE can choose the No-Action Alternative and the Secretary of Energy could do so in a subsequent Record of Decision. The DEIS must provide analytical evidence as to why whichever alternative is selected.

Response
DOE analyzed the No-Action Alternative to serve as a basis for comparing the magnitude of potential environmental impacts of the Proposed Action. Under the No-Action Alternative, and consistent with the NWPA, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate any significant adverse environmental impacts. In addition, DOE would prepare a report to Congress, with the Department's recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage at the generator sites, commercial utilities and DOE would have to continue managing spent nuclear fuel and high-level radioactive waste in a manner that protected public health and safety and the environment. However, the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain was not approved is uncertain.

In light of these uncertainties, DOE decided to illustrate the possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios – long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years (Scenario 1), and long-term storage with no effective institutional control after about 100 years (Scenario 2). Although the Department agrees that neither of these scenarios is likely, it selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur.

As discussed in Section 2.6 of the EIS, the Secretary of Energy would consider not only the potential environmental impacts and public comments on the EIS, but also other factors in determining whether to recommend the Yucca Mountain site to the President. Factors could include those identified through public input, but others as well, including:

- Ability to obtain necessary approvals, license, and permits
- Ability to fulfill stakeholder agreements
- Consistency with DOE mission
- Assurance of safety facility construction and operations flexibility
- Cost of implementation
- Ability to mitigate impacts

9.1 (4407)
Comment - EIS001555 / 0004
So as far as where this nuclear waste can go, who knows, there is no safe place.

Leaving it on site is the worst place to put it, short of dumping it in the middle of Lake Erie. And the reason why is every nuclear power plant in the United States is sited on a river, a lake, or around the ocean coast. The reason being they need all that water for their operations, you know, millions of gallons. And yet if you leave the waste on Lake Erie, on a river, on an ocean coast, if there is a tornado, whatever, the Nuclear Regulatory Commission has stated in a hearing they had in Lake County about the Perry Nuclear Power Plant that low level radioactive waste, if stored in a special radioactive waste storage building, that CEI was going to do there, but now apparently doesn't have to, could destroy the building and spread radioactive waste around the community, according to testimony that was in the transcript from an official at the NRC. So a tornado can pick up a car, it can pick up a cow, can a tornado pick up a dry cask of radioactive waste and throw it in to Lake Erie, sure, why not?

Response
DOE believes that the Federal policy to dispose of such wastes underground in a mined geologic repository continues to be the most promising method to provide reasonable expectation of adequate protection of public health and the environment from potential radiation impacts.

The Nuclear Regulatory Commission licenses spent nuclear fuel storage facilities at commercial nuclear generating sites under 10 CFR Part 72. License requirements for such facilities include extensive safety analyses that consider the impacts of plausible manmade and natural phenomenon accident-initiating events (including earthquakes, tornadoes, lightening, hurricanes, floods, tsunami, and seiches). These safety analyses must demonstrate that the facilities are able to withstand the most severe wind loadings (tornado winds and tornado-generated missiles) and flooding from the Probable Maximum Hurricane with minimal release of radioactive material. Therefore, it is highly unlikely that a tornado could pick up a dry cask of spent nuclear fuel and carry it into Lake Erie.

However, because of lower hazard and shorter storage times, these requirements might not exist under the 10 CFR Part 50 license used for storing low-level radioactive waste. DOE did not evaluate potential impacts associated with onsite storage of low-level radioactive waste because these wastes are not candidates for disposal at Yucca Mountain under the Proposed Action.

9.1 (4482)
Comment - EIS001376 / 0008
The DEIS states (at S.3.2) that neither No-Action Scenario would be likely, ostensibly because the Nation could pursue one of numerous other alternatives to manage SNF [spent nuclear fuel] and HLW [high-level radioactive waste] if Yucca Mountain is not licensed. However, history has shown that the Nation and the federal government have failed to implement any of those other alternatives and have also failed to identify and implement a viable permanent storage option. If there are other scenarios which are considered viable, they should be analyzed as part of the EIS.

The No-Action Scenarios emphasize the problems created by temporary, consolidated storage facilities, which are also not considered in the DEIS, e.g., a temporary facility at Yucca Mountain and/or the proposed PFS [the Private Fuel Storage] facility in Skull Valley, Utah. Moving SNF to temporary facilities, which would not be constructed but for the status of a permanent facility, transfer the risk of storage to new sites.

The federal government should not license or operate any consolidated, temporary SNF storage facilities at Yucca Mountain or in Utah. Under any Scenario other than No-Action, such facilities would not be needed, based on the evaluation in the DEIS.

On the other hand, if temporary, consolidated SNF storage facilities are licensed at Yucca Mountain or Skull Valley, but permanent storage at Yucca Mountain ultimately is not licensed, the risks (as defined in the No-Action Scenarios) will have been shifted from existing nuclear power plant facilities to new sites for which there is currently no risk or responsibility for management of high-level nuclear waste. That impact, as indicated above, is not adequately addressed for Skull Valley, Utah or Yucca Mountain, Nevada in this DEIS.

Response
DOE analyzed the No-Action Alternative to serve as a basis for comparing the magnitude of potential environmental impacts of the Proposed Action. Under the No-Action Alternative, and consistent with the NWPA, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate any significant adverse environmental impacts. In addition, DOE would prepare a report to Congress, with the Department's recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage at the generator sites, commercial utilities and DOE would have to continue managing spent nuclear fuel and high-level radioactive waste in a manner that protected public health and safety and the environment. However, the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain was not approved is uncertain.

DOE recognizes that a number of possibilities could be pursued, including continued storage of spent nuclear fuel and high-level radioactive waste at existing sites and/or one or more centralized locations, study and selection of another location for a deep geologic repository (Chapter 1 identifies the process and alternative sites previously selected by DOE for technical study as potential geologic repository locations), the development of new technologies (for example, transmutation), or reconsideration of alternatives to geologic disposal. The environmental considerations of these possibilities have been analyzed in other contexts in other documents to varying degrees.

In light of these uncertainties, DOE decided to illustrate the possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios – long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years (Scenario 1), and long-term storage with no effective institutional control after about 100 years (Scenario 2). Although the Department agrees that neither of these scenarios is likely, it selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur.

9.1 (4850)
Comment - EIS001215 / 0001
The draft EIS does not adequately address the potential impacts of various forms of "no action" on Hanford. Substantial quantities of high-level waste and spent fuel would remain in storage at Hanford. The impact of this indefinite long-term storage must be considered.

The EIS states that different and less conservative parameters were used in evaluating the No Action Alternative as compared to those used for the repository analysis so as not to unduly influence the results in favor of the repository. As a result, the standards of the analysis become a comparison of apples and oranges. It is abundantly clear from the current extensive contamination of soils and groundwater at Hanford that these wastes are mobile and they will spread in the surface and near-surface environment. There are also additional unique driving forces including burrowing animals, insects and plants that increase these problems. The No Action Alternative analysis must be conducted with equal rigor and protection in its general assumptions for the comparison to have any real meaning.

Response
DOE agrees that potential impacts at the Hanford Site could be greater than the estimates in this EIS. Section K.4.4 of the EIS acknowledges that the No-Action Alternative impacts in Chapter 7 and Appendix K could be much larger or smaller than those estimated because of uncertainties associated with the numerical values used in the calculations. However, such uncertainties are typical of predictions of the outcome of complex physical and biological phenomena over long periods (such as the 10,000-year analysis period). DOE believes that these estimates (with their uncertainties) adequately describe the potential environmental impacts that could occur from continued storage at or near existing facilities, and are valuable to the decisionmaking process.

DOE notes that potential impacts associated with onsite management of spent nuclear fuel and high-level radioactive waste have been analyzed in greater detail in other EISs, such as the *Final Environmental Impact Statement for the Tank Waste Remediation System, Hanford Site, Richland, Washington* (DIRS 103214-DOE 1996), and *Addendum (Final Environmental Impact Statement): Management of Spent Nuclear Fuel from the K-Basins at the Hanford Site, Richland, Washington* (DIRS 103213-DOE 1996).

9.1 (4852)
Comment - EIS001215 / 0003
The selection of wastes to send to the High Level Waste repository creates orphan wastes. This has serious repercussions. One such example is the spent nuclear fuel stored at Hanford. If some small part of this material is left at Hanford, nearly the full costs of continuing to operate the storage facilities for these wastes will continue for the indefinite future. It makes more sense to include all of the spent nuclear fuel from Hanford as a single unit for disposal. On the other hand, if the waste is not sent for disposal, it has no other path forward and additional work will be needed in the next 50 years to remove the fuel from storage and process it into a form that can either be safely maintained for the long term, or disposed elsewhere. It is not safe for storage in its currently planned form for more than about 50 years. Questions also remain unanswered about the ultimate status of "Greater than Class C" and "Special Case" wastes and other spent fuel waste forms, such as spent fuel from the Fast Flux Test Facility currently stored at Hanford.

Response
The two No-Action scenarios in the EIS include an evaluation of continued storage of the entire foreseeable inventory of spent nuclear fuel and high-level radioactive waste. However, as the commenter notes, under the DOE Proposed Action of disposal of 70,000 MTHM, some spent nuclear fuel and high-level radioactive waste would not be part of that capacity allocation and would require continued management. Its emplacement at Yucca Mountain would require legislative action by Congress unless a second repository was in operation. A separate National Environmental Policy Act evaluation, as well as legislative action, would have to occur before a second repository could be licensed for the disposal of the remaining inventory. The continued management of these materials at the Hanford Site are not within the scope of this EIS; they are already addressed in two other DOE documents: *Department of Energy Programmatic Spent Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement* (DIRS 101802-DOE 1995) and *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DIRS 101816-DOE 1997).

The No-Action analysis evaluated the DOE spent nuclear fuel and high-level radioactive waste at existing sites or at sites where existing Records of Decisions have placed or will place these materials. For example, the Record of Decision (60 *FR* 18589, April 12, 1995) for the *Final Supplemental Environmental Impact Statement, Defense Waste Processing Facility* (DIRS 103191-DOE 1994) decided to complete construction and operate the Defense Waste Processing Facility and associated facilities at the Savannah River Site to pretreat, immobilize, and store high-level radioactive waste. Similarly, the *Site Final Environmental Impact Statement for the Tank Waste Remediation System, Hanford Site, Richland, Washington* (DIRS 103214-DOE 1996) identified ex situ vitrification of high-level radioactive waste with onsite storage until final disposition in a geologic repository as the preferred alternative. For DOE spent nuclear fuel, the Record of Decision (60 *FR* 28680, June 1, 1995) for the *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement* (DIRS 101802-DOE 1995) decided that Hanford production reactor fuel would remain at the Hanford Site; aluminum-clad fuel would be consolidated at the Savannah River Site; and non-aluminum-clad fuels (including spent nuclear fuel from the Fort St. Vrain reactor and naval spent nuclear fuel) would be transferred to the Idaho National Engineering and Environmental Laboratory.

The decisions on the types and quantities of materials that will be moved as well as the timeframe for these activities have been and are continuing to be made in programmatic documents (for example, DIRS 101802-DOE 1995). Therefore, the evaluation of impacts related to these decisions are in those documents and are beyond the scope of the Yucca Mountain EIS.

9.1 (4853)
Comment - EIS001215 / 0004
In addition to the serious discrepancies with the No Action Alternative noted by Washington, another major problem involves the potential failure and release mechanisms if the waste is processed into glass intended for repository disposal and which is instead left in near surface storage. The alloys planned for the containers may not be suitable for long term surface or near surface storage. The glass waste form is likewise not designed to withstand the corrosive effects of surface waters containing erosive organic vegetative decay products such as humic and fulvic

acids. These materials corrode glass far more rapidly than their low acidity would indicate. They do not exist in waters that would be encountered in a repository setting, but they are always present in surface waters.

Response
Under No-Action Scenario 2, the failure and release models used to evaluate the long-term impacts of onsite storage of high-level radioactive waste assumed that corrosion of the stainless-steel canisters and dissolution of the waste matrix would result from contact with precipitation–not surface water (see Section K.2 of the EIS). Therefore, vegetative decay products should not be an important consideration. However, the estimated Region 5 impacts attributable to high-level radioactive waste (135 person-rem) are less than 0.04 percent of those from spent nuclear fuel (382,000 person-rem), assuming the Proposed Action inventory (70,000 metric tons of heavy metal). Over the 10,000-year analysis period, these impacts would result from an estimated 1-percent dissolution of approximately 2,000 canisters of high-level radioactive waste and 100-percent dissolution of 2,300 metric tons of heavy metal of DOE spent nuclear fuel. In view of these estimates, even if the Department significantly underestimated the corrosion rate for the high-level radioactive waste containers or the dissolution rate for the waste matrix, the maximum additional dose could increase by a factor of 100 (assuming 100-percent dissolution) resulting in an additional dose of about 13,000 person-rem or 3 percent of the dose attributable to the DOE spent nuclear fuel. This additional dose could result in an additional 7 latent cancer fatalities over the 10,000-year analysis period. This increase would be a small fraction of the 230 latent cancer fatalities predicted for Region 5 (see Section K.3.1) and is well within the overall uncertainties that DOE acknowledges in Section K.4.

9.1 (4874)
Comment - EIS000337 / 0012
Pg. 2-65, High-Level Radioactive Waste Storage Facilities, 2nd par.: "the canister cavities are galvanized steel...." Why not stainless steel?

Response
The primary purpose of the canister cavities is to direct cooling air around the high-level radioactive waste. Because the high-level radioactive waste, which would be in welded stainless-steel canisters, would never come in direct contact with the wall of the canister cavity, DOE elected to use galvanized steel to reduce the overall cost.

9.1 (4894)
Comment - EIS000337 / 0034
Pg. 9-13, Long-Term Performance Measures Under Consideration: The referenced studies are useful for the No-Action Alternative. The implementation of the noted measures would be very germane to the dry storage facilities.

Response
The barrier measures described in Section 9.2.8 of the EIS would be appropriate for reducing package corrosion, delaying or reducing water transport, retarding radionuclide movement and release rates, and reducing potential damage to canisters from factors in the subsurface environment such as rockfall. These measures would be appropriate for a subsurface environment when human intervention is not possible or practicable (that is, loss of institutional control after repository closure).

The No-Action Alternative includes two hypothetical scenarios: (1) Scenario 1, which assumes the maintenance of institutional controls at the 77 storage facilities for the entire 10,000-year analysis and (2) Scenario 2, which assumes no credit for institutional controls after the first 100 years.

Under Scenario 1, the barrier measures described in Section 9.2.8 of the EIS would not be necessary or appropriate because continuous surveillance and maintenance of the facilities and storage canisters would ensure the timely identification and repair of environmental degradation of these structures and canisters, thereby ensuring containment of radioactive materials. Although DOE considers both scenarios unlikely (see Section 2.2 and the introduction to Chapter 7 of the EIS), if long-term onsite storage became a reality, storage facilities and canisters probably would undergo some design evolution to increase their useful lifetimes and to enhance the long-term integrity and corrosion resistance of the canister. However, because institutional control would remain in effect, design enhancements would probably not differ greatly from today's designs.

Because Scenario 2 takes no credit for institutional control after the first 100 years, it would not be appropriate to assume funding to construct long-term, surface storage facilities that could benefit from the barrier measures discussed in Section 9.2.8 of the EIS because of their high cost.

9.1 (5040)
Comment - EIS001520 / 0008
The Board believes that neither of the no-action scenarios evaluated in the draft EIS is likely to occur, but the two scenarios do appear to represent the extremes of a spectrum of possible futures. Because the no-action alternative is hypothetical, there may be little merit in attempting analyses of this alternative more sophisticated than those presented in the draft EIS.

Response
DOE agrees that neither of these scenarios would be likely if there was a decision not to develop a repository at Yucca Mountain. Because DOE did not want to influence the analysis results to favor the repository, it used assumptions that generally resulted in lower predicted impacts rather than applying the conservative assumptions used in many of the repository impact analyses.

9.1 (5426)
Comment - EIS001887 / 0125
Page 2-61; Section 2.2.2.1 - Storage Packages and Facilities at Commercial and DOE Sites

It is beyond the scope of this Draft EIS to assume, without further DOE commitment, how DOE spent fuel and high-level radioactive waste would be stored at DOE facilities. Most of the high-level waste is currently in liquid form in underground storage tanks and will still be in 2002, when the No-Action Alternative is assumed to start.

Response
The Department agrees that it is beyond the scope of this EIS to specify how DOE spent nuclear fuel and high-level radioactive waste would be stored at DOE facilities. Therefore, as discussed in Section 7.2 of the EIS, the No-Action analysis evaluated the impacts from continued storage assuming that the DOE materials were at the sites specified in existing DOE Records of Decision for prior environmental documentation. For example, the Hanford Site *Final Environmental Impact Statement for the Tank Waste Remediation System* (DIRS 103214-DOE 1996) identified ex situ vitrification of high-level radioactive waste with onsite storage until final disposition in a geologic repository as the preferred alternative. For DOE spent nuclear fuel, the Record of Decision (60 *FR* 28680, June 1, 1995) for the *U.S. Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement* (DIRS 101802-DOE 1995) decided that Hanford production reactor fuel would remain at the Hanford Site, aluminum-clad fuel would be consolidated at the Savannah River Site, and non-aluminum-clad fuels (including spent nuclear fuel from the Fort St. Vrain reactor and naval spent nuclear fuel) would be transferred to the Idaho National Engineering and Environmental Laboratory. Therefore, the analysis evaluated DOE aluminum-clad spent nuclear fuel at the Savannah River Site, DOE non-aluminum-clad fuels at the Idaho National Engineering and Environmental Laboratory, most of the Fort St. Vrain spent nuclear fuel at the Colorado generating site, and high-level radioactive waste at the generating sites (the West Valley Demonstration Project, the Idaho National Engineering and Environmental Laboratory, the Hanford Site, and the Savannah River Site).

In addition to assigning various materials to specific DOE facilities, the National Environmental Policy Act documents citied above also evaluate potential environmental impacts of various storage options for DOE spent nuclear fuel and high-level radioactive waste including, under the No-Action Alternative, continued storage of high-level radioactive waste in underground tanks. These documents also describe facilities used for long-term storage of processed waste (for example, borosilicate glass), most of which have been designed and are either completed (Savannah River Site Glass Storage Facility) or under construction.

Because the cited National Environmental Policy Act documents have addressed the environmental impacts associated with the processing and storage of DOE spent nuclear fuel and high-level radioactive waste, and to simplify the analyses, DOE limited the No-Action Alternative impact analyses to those resulting from long-term

storage of processed, road-ready materials. These analyses assumed that these materials would be stored in the structures described in the cited National Environmental Policy Act documents.

9.1 (5427)
Comment - EIS001887 / 0126
Page 2-67; Section 2.2.2.3 - No-Action Scenario 2

This paragraph conflicts with the third paragraph on page 2-59 that describes the two scenarios for the No-Action Alternative. The information should be consistent.

Response
DOE can find no inconsistencies between the sections cited.

9.1 (5445)
Comment - EIS001660 / 0007
The DEIS must include a realistic no-action alternative. It repeatedly says that the no-action scenarios are unlikely and unreasonable; however, it says these scenarios provide a baseline for comparison. The no-action alternative is only the absence of the proposed action. It must be analyzed fairly using consistent assumptions regarding institutional controls and all other relevant factors.

According to the DEIS (p. 3-140), the description of the affected environment for the no-action alternative "describes the affected environment that reflect (sic) the average or mean conditions of the sites." Thus, "average" conditions mean nothing and provide no information that one could use to evaluate the no-action alternative. The DOE presumably knows, and must disclose the existing conditions in the vicinity of the sites that generate SNF and HLW. Without a description of the affected environment, no meaningful analysis of anticipated impacts is possible.

Response
DOE analyzed the No-Action Alternative to serve as a basis for comparing the magnitude of potential environmental impacts of the Proposed Action. Under the No-Action Alternative, and consistent with the NWPA, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate any significant adverse environmental impacts. In addition, DOE would prepare a report to Congress with the Department's recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage at the generator sites, commercial utilities and DOE would have to continue managing spent nuclear fuel and high-level radioactive waste in a manner that protected public health and safety and the environment. However, the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain was not recommended and approved is uncertain.

DOE recognizes that a number of possibilities could be pursued, including continued storage of spent nuclear fuel and high-level radioactive waste at existing sites and/or one or more centralized locations, study and selection of another location for a deep geologic repository (Chapter 1 identifies the process and alternative sites previously selected by DOE for technical study as potential geologic repository locations), the development of new technologies (for example, transmutation), or reconsideration of alternatives to geologic disposal. The environmental considerations of these possibilities have been analyzed in other contexts in other documents to varying degrees.

In light of these uncertainties, DOE decided to illustrate the possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios – long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years (Scenario 1), and long-term storage with no effective institutional control after about 100 years (Scenario 2). Although the Department agrees that neither of these scenarios is likely, it selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur.

DOE agrees that Chapter 3 of the EIS should include additional baseline information for the 77 storage locations to enable for a comparative evaluation of potential impacts of the No-Action Alternative. Accordingly, Section 3.3 now contains additional information on No-Action site conditions.

9.1 (5546)
Comment - EIS001660 / 0044
Unreasonable "No-action" alternatives - Two no-action alternatives were provided. One would have the radioactive waste stay where it is under institutional control for just 100 years. The second would have the waste stay under institutional control for 10,000 years. DOE acknowledges that neither is likely to occur but says that other scenarios would be too speculative. Reasonable alternatives should be analyzed and included in the DEIS. Mineral County accepts Eureka County's analysis for its own comments. See Attachment D (page 21 of 26 of Eureka County's comments.) [Following is text from reference.]

Analysis of no-action alternative inconsistent and biased. Despite statements to the contrary, the analysis of the proposed action and the no-action alternative is not consistent. (See pp. 7-9,-16) The statement on p. 7-9 that Chapter 3, section 3.3, discusses the conditions at the sites that formed the basis for identifying impacts of the no-action alternative is not true. The statement on p. 7-11 that the Yucca Mountain workforce would lose their jobs under the no-action alternative is unsupported and alarmist; it reflects bias. The statement on p. 7-12 that payments in lieu of taxes would be diminished under the no-action alternative is unsupported. The analysis of in-lieu payments should address both costs and revenues. The statement on p. 7-46 that concentrations and areas affected by radiation from Module 1 would be impossible to estimate is untrue on its face.

Response
DOE recognizes that neither No-Action Alternative scenario is likely to occur (see Section 2.2 and the introduction to Chapter 7 of the EIS). To enable a comparison of the impacts between the Proposed Action and the No-Action Alternative, DOE took care, for example, to maintain consistency, where possible, with the assumptions used to evaluate the proposed repository. In pursuit of this goal, the Department structured the Scenario 2 analysis to facilitate an impact comparison with the repository impact analysis. Section K.1 of the EIS describes these important consistencies.

Scenario 1, which includes an analysis of impacts under effective institutional control for at least 10,000 years, is consistent with the portion of the analysis of the Proposed Action that includes an analysis of effective institutional control at the repository for the first 100 years after closure. Scenario 2, in which the analysis does not consider institutional control after approximately 100 years, is parallel to the portion of the Proposed Action analysis in which long-term performance after 100 years also does not include institutional control.

Section 3.3 of the Final EIS contains more information on the No-Action site conditions.

Under the No-Action Alternative, DOE would not proceed with the development of a repository at Yucca Mountain. Following any reclamation actions, workers assigned to the repository would have no remaining work. Unless the workforce was reassigned or new missions were identified, the workforce would be reduced. This assumption is based on the fact the Department cannot use tax receipts or the Nuclear Waste Fund to support workers for whom there is no identified mission.

Payments-Equal-To-Taxes are made pursuant to Section 116(c)(3)(A) of the NWPA, which requires the Secretary of Energy to "...grant to the State of Nevada and any affected unit of government, an amount each fiscal year equal to the amount such State or affected unit of government, respectively, would receive if authorized to tax site characterization activities..." These payments, historically and for the future, are determined by estimating the amount of Yucca Mountain Project property, purchases (in and out of the State of Nevada), and business activities (employees) within the jurisdiction of an affected unit of local government. Under the No-Action Alternative for the repository, the number of employees and purchases would be significantly lower. As a consequence, it is accurate to state that Payments-Equal-To-Taxes would be correspondingly lower, and could even be eliminated in the long term.

Through Fiscal Year 1999, DOE has paid over $41 million to the State of Nevada and other affected units of local government. Estimated payments for Fiscal Years 2000 through 2003 would be about $44 million, for a total of

about $85 million. Most of these payments are made to Nye County; for example, DOE's Fiscal Year 2001 budget and proposed Fiscal Year 2002 funding for Payments-Equal-To-Taxes for Nye County alone are $10 million each. [May 2, 2001, presentation by Victor Trebules to the meeting of the affected units of local government.)

DOE has not estimated Payments-Equal-To-Taxes beyond 2003 and does not intend to make long-term Payments-Equal-To-Taxes estimates. While the Nuclear Waste Policy Act requires Payments-Equal-To-Taxes, they are not discriminating factors in the EIS decisionmaking process.

DOE agrees with the commenter that the statement in Section 7.3.2.1 of the Draft EIS, "...concentrations and areas affected by radiation from Module 1 would be impossible to estimate..." is untrue. The statement in the EIS now reads "...concentrations and areas affected by radiation from Module 1 would be difficult to estimate with any level of accuracy...."

9.1 (5785)
Comment - EIS001887 / 0381
APPENDIX K. LONG-TERM RADIOLOGICAL IMPACT ANALYSIS FOR THE NO-ACTION ALTERNATIVE

Two No-Action Alternatives are considered by DOE, both involving long-term storage at present locations: (1) Long-term storage at present locations with effective institutional control for at least 10,000 years; and (2) Long-term storage at present locations with no effective institutional control after 100 years. Another alternative, perhaps more likely, is storage at a centralized location, such as the proposed PFS [Private Fuel Storage] facility in Skull Valley, Utah. The environmental impact of this alternative should be seriously investigated by DOE.

While DOE researchers have attempted to construct the impact analysis of the No-Action Alternative in parallel to the analysis conducted for the proposed Yucca Mountain repository, in several respects, researchers have not been successful.

For decentralized storage at reactor sites where spent fuel is presently stored, a major concern over the long-term is the freeze-thaw cycle. As DOE researchers note, freeze-thaw cycles lead to concrete spalling and weakening of the concrete overpacks around spent fuel canisters (page K-4). In addition, storage canisters can degrade due to corrosion caused by acidity and chloride concentration. This can be followed by water infiltration (page K-8). The final barriers to radionuclide release are the fuel cladding and the fuel matrix (page K-9).

According to DOE, degradation appears to begin at about 7,000 to 8,000 years. In year 10,000, less than 1% of the cladding has degraded. This is primarily the stainless steel clad fuel. For zirconium, degradation begins about 10,000 years (page K-11).

Table K-4 [Section K.2.2] lists radionuclides important to dose for this decentralized storage scenario: Am [americium]-241, Am-243, Np [neptunium]-237, Pu [plutonium]-238, Pu-239, Pu-240 and Tc [technetium]-99. (p. K-14) These radionuclides are important, but they are not the radionuclides considered in the repository analysis. Of these, only Np-237 is directly considered in the repository analysis. Pu-239 (49%) and Pu-240 (47%) contribute most of the dose, followed by Am-241 (3.2%).

Response
The scenario for possibly moving the spent nuclear fuel and high-level radioactive waste to a centralized interim storage or monitored retrievable storage site has been evaluated by others, and the Private Fuel Storage facility at Skull Valley, Utah, is currently under study by the Nuclear Regulatory Commission (see the introduction to Chapter 7 of the EIS for details). However, DOE recognizes interim storage at the Private Fuel Storage facility to be a reasonably foreseeable future action and has included this action as part of the cumulative impacts analysis in Chapter 8.

For the No-Action Alternative, DOE evaluated more than 200 radionuclides for potential human health impacts including all of the radionuclides considered in the repository analysis. Some of the radionuclides important to the repository analysis do not appear in the table in Section K.2.2 because they are not important contributors to radioactive dose in the No-Action case. However, the listed radionuclides are those determined to contribute more than 99.5 percent of the total dose under Scenario 2 of the No-Action Alternative.

9.1 (6016)
Comment - EIS001879 / 0041
The no action alternative scenarios are, even by the Department's admission, speculative in nature, and the assumptions for institutional control have no technical or historical basis. Such is the baseline "No action alternative" which the Department has examined in great detail. Yet, on-going NRC [Nuclear Regulatory Commission] licensing activities that would directly influence the implementation of the NWPA [Nuclear Waste Policy Act] (connected actions), and could also affect the need for a repository, are not even evaluated.

Response
DOE analyzed the No-Action Alternative to serve as a basis for comparing the magnitude of potential environmental impacts of the Proposed Action. Under the No-Action Alternative, and consistent with the NWPA, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate any significant adverse environmental impacts. In addition, DOE would prepare a report to Congress, with the Department's recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage at the generator sites, commercial utilities and DOE would have to continue managing spent nuclear fuel and high-level radioactive waste in a manner that protected public health and safety and the environment. However, the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain was not approved is uncertain.

DOE recognizes that a number of possibilities could be pursued, including continued storage of spent nuclear fuel and high-level radioactive waste at existing sites and/or one or more centralized locations, study and selection of another location for a deep geologic repository (Chapter 1 identifies the process and alternative sites previously selected by DOE for technical study as potential geologic repository locations), the development of new technologies (for example, transmutation), or reconsideration of alternatives to geologic disposal. The environmental considerations of these possibilities have been analyzed in other contexts in other documents to varying degrees.

In light of these uncertainties, DOE decided to illustrate the possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios – long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years (Scenario 1), and long-term storage with no effective institutional control after about 100 years (Scenario 2). Although the Department agrees that neither of these scenarios is likely, it selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur.

9.1 (6076)
Comment - EIS001469 / 0002
I challenge the conclusion a little bit in terms of no action. While the Department of Energy states that both no-action alternatives are not feasible and wouldn't be done, nevertheless, the actual health impacts from the long-term scenario 2 would actually be less than the Yucca Mountain repository by their own calculations, even though I suppose it's not considered reasonable. So that implies to me that there must be something in between there that's much more reasonable and much better for the health and safety and should be addressed.

Response
DOE analyzed the No-Action Alternative to serve as a basis for comparing the magnitude of potential environmental impacts of the Proposed Action. Under the No-Action Alternative, and consistent with the NWPA, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate any significant adverse environmental impacts. In addition, DOE would prepare a report to Congress, with the Department's recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage at the generator sites, commercial utilities and DOE would have to continue managing spent nuclear fuel and high-level radioactive waste in a manner that protected public health and safety and the environment. However, the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain was not approved is uncertain.

DOE recognizes that a number of possibilities could be pursued, including continued storage of spent nuclear fuel and high-level radioactive waste at existing sites and/or one or more centralized locations, study and selection of another location for a deep geologic repository (Chapter 1 identifies the process and alternative sites previously selected by DOE for technical study as potential geologic repository locations), the development of new technologies (for example, transmutation), or reconsideration of alternatives to geologic disposal. The environmental considerations of these possibilities have been analyzed in other contexts in other documents to varying degrees.

In light of these uncertainties, DOE decided to illustrate the possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios–long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years (Scenario 1), and long-term storage with no effective institutional control after about 100 years (Scenario 2). Although the Department agrees that neither of these scenarios is likely, it selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur.

The EIS does not indicate that the impacts for No-Action Scenario 2 would be smaller than those for Scenario 1. Section 2.4 indicates that overall public health and safety impact estimates would be greater for Scenario 2 and cost impacts would be greater for Scenario 1.

9.1 (6146)
Comment - EIS001654 / 0036
Page S-64. DEIS Findings Clearly Support the Conclusion that the Proposed Action is Far Superior to No Action

The first two sentences of the first paragraph summarize well what the 1,400 page DEIS demonstrates: the impacts of the Proposed Action to develop the repository at Yucca Mountain are minor. Conversely, we simply repeat the third paragraph:

"There could be **large public health and environmental consequences** under the No-Action Alternative if there were no effective institutional control, causing storage facilities and containers to deteriorate and radioactive contaminant from spent nuclear fuel to enter the environment. In such circumstances, there would be *widespread* contamination at the 72 commercial and 5 DOE sites across the United States, with resulting human health impacts." (emphasis added.)

Anyone who attended the 21 public hearings certainly heard numerous public expressions of fear over the perceived harmful radiological effects of either the repository itself or transportation of waste to it. That testimony, while sincerely stated, was often unrelated to the information in the DEIS. The harmful effects of the No-Action Alternatives, though greater by orders of magnitude and more certain, drew less attention, even though the DEIS does provide demonstrable quantification of the aggregate risk. That may be because:

- DOE is not actually proposing to leave the waste in those 77 locations for 10,000 years, and

- No analysis was provided for the long-term effects in a specific or typical temporary storage site, nor was a public hearing held at such a location.

We share the conclusion of Section S.11. We would restate it ourselves that there is simply no comparison of the certain and far more harmful impacts of either of the No-Action Alternatives with the relatively minor and manageable impacts of the Proposed Action.

Response
As discussed in the Foreword, the purpose of the EIS is to provide information on the environmental impacts that could result from the Proposed Action, as well as a basis for comparison of the two No-Action scenarios. DOE has developed this information for the Secretary of Energy's consideration, along with other factors required by the NWPA, in making a determination whether to recommend Yucca Mountain as the site for the Nation's first monitored geologic repository.

For this reason, and in accordance with the National Environmental Policy Act process, DOE has presented this environmental information without conclusions as to the level of environmental impacts that could be acceptably small or unacceptably large. These are in essence policy decisions that would ultimately be made by the President and Congress, if necessary.

9.1 (6474)
Comment - EIS001632 / 0032
Page 3-142, Section 3.3.3: This section states that, "DOE calculated the river flow past each population center ... and used this number in the calculation to determine dose to the population." The final EIS should provide the dose calculation used.

Response
Appendix K of the EIS cites reference documents that include the details of the dose calculations. Information on these documents is available at DOE Reading Rooms and on the DOE Internet site (*http://www.ymp.gov*).

9.1 (6573)
Comment - EIS001632 / 0059
Page 7-38, end of the first partial paragraph: EPA appreciates that for comparison purposes and to avoid the appearance of bias toward the preferred alternative, "DOE did not want to overestimate the impacts from Scenario 2." However, the document should provide an estimate or a range of impacts for the reader.

Response
As is typical for deterministic analyses such as those performed to evaluate No-Action Scenarios 1 and 2, the EIS analysis used best estimate single-input values to produce a best estimate result. As is also typical with these analyses, a separate analysis (semi-quantitative) addressed the uncertainty associated with the input values and assumptions and provided an assessment of the effects these uncertainties could have on the model results (see Section K.4 of the EIS for details).

However, for Scenario 2 the analysis provided a range of best estimate impact values between regions for collective, as well as individual, impacts (see the tables in Section K.3.1 of the EIS). This was done to illustrate the importance of environmental transport human exposure (exposed population) parameters. Also under this scenario, a range of accident impacts was provided for high and low populations. Under Scenario 1, impact ranges were not developed because all collective and individual impacts were extrapolated from information provided by the Nuclear Regulatory Commission's environmental assessment of the Calvert Cliffs Independent Spent Fuel Storage Installation (DIRS 101898-NRC 1991).

As stated in Section K.4 of the EIS, DOE attempted to quantify a range of uncertainties associated with mathematical models and input data, and estimated the potential effect these uncertainties could have on collective human health impacts. By summing the uncertainties discussed in Sections K.4.1, K.4.2, and K.4.3 of the EIS where appropriate, DOE estimated that total collective impacts over 10,000 years could have been underestimated by as much as 3 or 4 orders of magnitude. However, because there are large uncertainties in the models used for quantifying the relationship between low doses (that is, less than 10 rem) and the accompanying health impacts, especially under conditions in which the majority of the populations would be exposed at a very low dose rate, the actual collective impact could be zero.

On the other hand, impacts to individuals (human intruders) who could move to the storage sites and live close to the degraded facilities could be severe. During the early period (200 to 400 years after the assumed loss of institutional control), acute exposures to external radiation from the spent nuclear fuel and high-level radioactive waste material could result in prompt fatalities. In addition, after a few thousand years onsite shallow aquifers could become contaminated to such a degree that consumption of water from these aquifers could result in severe adverse health effects, including premature death. Uncertainties associated with these localized impacts relate primarily to the inability to predict accurately how many individuals could be affected at each of the 77 sites over the 10,000-year analysis period. In addition, the uncertainties associated with localized impacts would exist for potential consequences resulting from unusual events, both manmade and natural. Therefore, as discussed in Section K.4 of the EIS, uncertainties resulting from future changes in natural phenomena and human behavior that cannot be predicted, process model uncertainties, and dose-effect relationships, when taken together, could result in

overestimating or underestimating the impacts by as much as several orders of magnitude relative to the values listed in Section K.3.

9.1 (6680)
Comment - EIS001632 / 0082
Page 14-19, definition of "inadvertent intrusion": The word "unintended" needs to be inserted before "disturbance," i.e., "The unintended disturbance of a disposal facility..." As currently written, the definition would include purposeful intrusions.

Response
DOE agrees with this recommendation and has included this change in the EIS Glossary.

9.1 (6683)
Comment - EIS001632 / 0083
Page 14-19, definition of "institutional control": This definition should distinguish between "active institutional control," which requires the presence of humans to take actions to safeguard and repair the repository, and "passive institutional control," which also includes controls such as permanent markers and land records to warn future generations of dangers from the disposal site.

Response
In the EIS Glossary, DOE has modified the definition of institutional control to include the distinction between active and passive control.

9.1 (6695)
Comment - EIS001632 / 0088
Page K-7, Figure K-3: This map shows failure times for above-ground concrete storage modules. The no-action impact analysis looked at a 100-year time frame, yet Figure K-3 indicates that in some areas of the country, failure could be expected in less than 75 years and, in other areas, between 75-100 years. The final EIS should evaluate the premature failure potential for those areas of the country where such could be expected in less than 100 years.

Response
Both No-Action scenarios assume that the onsite storage facilities would remain under effective institutional control for the first 100 years. This means that they would be monitored and maintained with repairs being made as necessary to ensure the integrity of the dry storage canisters. DOE recognizes that the weather-protection structures (metal buildings for DOE below-grade storage vaults and reinforced concrete storage modules for commercial spent nuclear fuel), as currently constructed, would not likely remain intact for the 100-year institutional control period without major repairs. Therefore, the Department assumed that a major repair effort would occur 50 years into the 100-year period (see the figure in the introduction to Chapter 7 of the EIS). For purposes of analysis, DOE assumed this major repair effort to require 50 percent of the manpower and materials required to completely replace the facilities. Collective occupational radiation doses were estimated to be 72 and 118 person-rem for the Proposed Action and Module 1 scenarios, respectively (see DIRS 104596-Orthen 1999). Although not reported separately, these impacts have been included in the short-term (first 100 years) impacts for both scenarios, as discussed in Sections 7.2.1 and 7.3.2 of the EIS.

Although the analysis assumed that under institutional control the storage facilities would be maintained and repaired as necessary, Sections K.4.1.1 and K.4.3.1 of the EIS discuss the uncertainties associated with maintenance of institutional control and uncertainties associated with environmental degradation and corrosion rates along with their potential impacts on the reported results. As stated in Section K.4.1.1, premature failure of effective institutional controls could result in an earlier release of radioactive materials to the accessible environment. However, this scenario would probably increase overall impacts by no more than a factor of 2.

9.1 (6724)
Comment - EIS001878 / 0076
Limitation on scope of analysis inappropriate. Although the DEIS says that the same spectrum of environmental impacts was considered for the no-action alternative as for the proposed action, it also says (in the same paragraph) that DOE decided to focus the no-action analysis on the health and safety of workers and members of the public.

(p. 7-6) This limitation on the scope of the no-action analysis is inappropriate. It rules out any meaningful comparison with the impacts of the proposed action.

Also, the implication (p. 7-7) that the proposed action does not affect the 72 commercial and 5 DOE facilities and their surrounding environments, but the no-action alternative does, is not true. Obviously, both alternatives would result in environmental impacts at all the sites.

Response
As the commenter noted, DOE considered the same spectrum of impacts for the Proposed Action and the No-Action Alternative. In accordance with Council on Environmental Quality regulations [40 CFR 1501.7 (a)], as part of the scoping process DOE identified the important issues to be analyzed in detail in the EIS. In addition, the Department was able to identify and eliminate from detailed study the issues that were either unimportant or had been covered by prior environmental review (40 CFR 1506.3). Thus, DOE focused the discussion on what it believes are the important issues.

DOE then identified the environmental impact areas with potential impacts common to both the Proposed Action and the No-Action Alternative. These common areas (occupational, public health and safety, and hydrology) received detailed evaluation under the No-Action Alternative.

DOE recognized that there would be potential for environmental impacts at the generator sites as part of the Proposed Action. The principal impacts identified were those associated with the loading of the spent nuclear fuel and high-level radioactive waste at the generator sites, and those associated with accidents that could occur during the loading operations. Section 6.2.2 of the EIS discusses the results of the impact analysis for the loading operations at the generator sites (specifically, radiological impacts and impacts from industrial hazards). Section 6.2.4.1 discusses potential impacts from accidents occurring during loading operations at the generator sites.

9.1 (7192)
Comment - EIS001337 / 0083
Page 2-74 Section 2.4.1. The use of the word "small" to describe impacts is not consistent with NEPA [National Environmental Policy Act] terminology. Although DOE considers impacts to be small they may yet be significant. For example, a small absolute change might represent a 50 percent increase or decrease in given parameter. The DEIS must evaluate impacts and risks on the basis of their significance not their absolute value. Further, NEPA requires that impacts, even if "small", be mitigated.

Response
The Council on Environmental Quality regulations require consideration of all impacts (large and small) and of both "context" and "intensity" when assessing the significance of a proposed action (40 CFR 1508.27). Consistent with the regulations, DOE quantifies impact estimates in most cases. The regulations also require that EISs be written in plain language so that the widest audience can readily understand them. To be consistent with the regulations, the Department has used descriptive terms, such as "small," to help convey the relative impacts of various actions on the environment.

Moreover, consistent with these requirements and the standards established by the Nuclear Regulatory Commission (DIRS 101899-NRC 1996; DIRS 101900-NRC 1996), the Department has determined, in general, that "small" means potential environmental effects (with or without mitigation) that are not detectable or are so minor that they would neither destabilize nor noticeably alter any important attribute of the resource. For example, human health impacts that do not exceed permissible levels as defined in Federal or state regulations are generally considered small because adverse health effects would not be expected for exposure to these levels.

The Department is committed to identifying mitigation measures. Potential mitigation measures are discussed in Chapter 9 of the EIS. However, the commenter's assertion that the National Environmental Policy Act requires mitigation of impacts (large or small) is incorrect.

9.1 (7379)
Comment - EIS001832 / 0010
The Draft Environmental Impact Statement's evaluation of two No Action Alternative (NAA) scenarios adequately bounds the complete spectrum of no action possibilities.

DOE included the two No Action Alternative (NAA) "to provide a baseline for comparison with the Proposed Action." The comparison provided demonstrates the tremendous societal benefit associated with the proposed action as opposed to doing nothing. These two scenarios adequately describe both ends of the full spectrum of "no action" possibilities. The NAA scenarios are comprehensive in describing the cost and environmental and human health impacts of the no action possibilities. NAA 1 sets the lower bound on environmental and human health impacts and the upper bound on the potential costs for the NAA. NAA 2 sets the upper bound on the environmental and human health impacts and the lower bound on the potential costs for the NAA. The human health impacts of the proposed action are shown to be lower than the lowest possible health impacts of "no action" (NAA 1) and the cost impacts of the proposed action are shown to be lower than the least costly "no action" possibility (NAA 2).

As part of the public hearing process, we understand that DOE has received some criticism for not constructing more realistic NAA scenarios. At the heart of much of this criticism is the realization that, in reality, society is unlikely to actually chose to take no action and simply leave spent fuel where it is over the long term. If the repository at Yucca Mountain does not go forward, society will "take some action" to manage spent nuclear fuel. DOE has recognized this in stating, regarding NAA Scenario 1 and 2, that "neither scenario would be likely if there were a decision not to develop a repository at Yucca Mountain, however they are part of the EIS to provide a baseline for comparison to the Proposed Action." In providing a basis for comparison through a bounding analysis, it is not necessary for DOE to address the likelihood of any specific "no action" possibilities or to attempt to identify the most likely outcomes. Any effort to be more specific within these bounds would only yield results that contain some combination of the costs and human health effects postulated for the two bounding scenarios, the net result of which will inevitably be higher impacts than for the proposed repository.

A true "no action" alternative means that no actions are taken beyond what is currently being done at reactor and DOE sites to store spent nuclear fuel. To assume, for DOE's purposes herein, that some action would be taken on the part of utilities or DOE, would not be consistent with the "no action" alternative concept. In short, in the case of used nuclear fuel management, there is an irreconcilable conflict between undertaking "no action" and being realistic. Therefore, DOE's bounding approach is a sound, complete and effective way to address the "no action" concept.

Rather than conducting additional "no action" analyses, a more valuable perspective would be provided for the public and decision-makers if DOE were to relate the risks and impacts of Yucca Mountain to other real risks and impacts that society already accepts.

Response
DOE agrees that the two No-Action scenarios provide a range of cost, environmental, and human health impacts that could result from a decision to abandon plans for the proposed Yucca Mountain Repository and that additional effort to perform more specific analyses would likely yield similar results and not provide substantive additional information. However, because DOE did not want to overestimate potential impacts and influence a decision in favor of the repository, neither of the No-Action scenarios was developed to provide the most pessimistic outcome based on the assumptions. In addition, DOE believes that the two No-Action scenarios provide an adequate basis for comparison to the Proposed Action.

DOE analyzed the No-Action Alternative to serve as a basis for comparing the magnitude of potential environmental impacts of the Proposed Action. Under the No-Action Alternative, and consistent with the NWPA, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate any significant adverse environmental impacts. In addition, DOE would prepare a report to Congress, with the Department's recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage at the generator sites, commercial utilities and DOE would have to continue managing spent nuclear fuel and high-level radioactive waste in a manner that protected public health and safety and the

environment. However, the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain was not approved is uncertain.

DOE recognizes that a number of possibilities could be pursued, including continued storage of spent nuclear fuel and high-level radioactive waste at existing sites and/or one or more centralized locations, study and selection of another location for a deep geologic repository (Chapter 1 identifies the process and alternative sites previously selected by DOE for technical study as potential geologic repository locations), the development of new technologies (for example, transmutation), or reconsideration of alternatives to geologic disposal. The environmental considerations of these possibilities have been analyzed in other contexts in other documents to varying degrees.

In light of these uncertainties, DOE decided to illustrate the possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios–long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years (Scenario 1), and long-term storage with no effective institutional control after about 100 years (Scenario 2). Although the Department agrees that neither of these scenarios is likely, it selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur.

Discussions in the EIS relate the impacts from Yucca Mountain operations to other real risks and impacts that exist in society. Specific examples are the comparisons of radiological health impacts to workers and the public to the radiological impacts these same people receive from natural background radiation, to which they are continually exposed (see the last paragraph of Section 4.1.7 of the EIS). Another example is the discussion of fatalities from spent nuclear fuel and high-level radioactive waste shipping operations in relation to impacts from overall transportation activities (Section 6.2.4.2.2).

DOE has added a discussion of relative risks to Appendix F of the EIS, which includes a discussion of radiation and other common risk factors.

9.1 (7647)
Comment - EIS001912 / 0099
The no-action alternative provides more details about specific proposals than the action alternative does. Why?

Response
DOE believes that both the Proposed Action and the No-Action Alternative contain the level of detail appropriate for the evaluation of potential environmental impacts. Without further detail, DOE is unable to determine the precise nature of the commenter's concern.

9.1 (7981)
Comment - EIS001577 / 0003
The no action scenario number two is absolutely irresponsible but a highly likely scenario given the nature of the nuclear industry and the regulating community. It is important that the people of the United States, their government, the DOE and the commercial utilities not allow this scenario to develop in a de facto manner. We all have the responsibility to monitor their actions so as to not allow it to develop. Collectively, the world population and the more responsible governments of the world have a responsibility to prevent this scenario from developing within this country and elsewhere on our planet.

Response
DOE has stated that it believes that neither No-Action Alternative scenario is likely. Continued storage of high-level radioactive waste and spent nuclear fuel at existing sites could be required for some time in the future if the Yucca Mountain site was not approved for a geologic repository. However, if such events occurred, DOE, consistent with the NWPA [Section 113(c)(3)], would prepare a report to Congress with its recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Until Congress provides additional direction for future actions, under current regulations and DOE directives, commercial and DOE sites have an obligation to continue to manage

the spent nuclear fuel and high-level radioactive waste in a manner that protects public health and safety and the environment.

No-Action Scenario 2 does not assume that there would be a decision to halt institutional control after 100 years. Rather, for purposes of long-term analysis, this scenario assumes no effective institutional control after approximately 100 years. DOE based its choice of 100 years on a review of the generally applicable Environmental Protection Agency regulations for the disposal of spent nuclear fuel and high-level radioactive waste (40 CFR Part 191) and Public Health and Environmental Radiation Protection Standards for Yucca Mountain, Nevada (40 CFR Part 197); Nuclear Regulatory Commission regulations for the disposal of low-level radioactive material (10 CFR Part 61); and the National Research Council report on standards for the proposed Yucca Mountain Repository (DIRS 100018-National Research Council 1995), all of which generally discount the consideration of institutional control for longer periods in performance assessments for geologic repositories. The assumption of no effective institutional controls after 100 years provides a consistent analytical basis for comparing the No-Action Alternative and the Proposed Action.

9.1 (8027)
Comment - EIS000817 / 0071
"No Action Alternative" -- why don't you evaluate creating no more spent fuel? If Yucca Mountain were found inadequate, certainly it would be prudent to stop spent fuel creation. It only makes sense. Yet DOE evaluates "no effective institutional control after 100 years" -- why? Of what value is that? Certainly the waste would be controlled and certainly less waste would be easier to control. Why is the assumption that we have to create 70,000 MTHM valid? It should not be.

Response
The No-Action scenarios were constructed to provide a basis for comparison with the Proposed Action (Section 2.2 of the EIS). Under the Proposed Action, as discussed in Section 2.1, DOE would dispose of 70,000 metric tons of heavy metal in the repository. Therefore, the amount of spent nuclear fuel and high-level radioactive waste considered in the No-Action analysis is also 70,000 metric tons of heavy metal. DOE analyzed the No-Action Alternative to serve as a basis for comparing the magnitude of potential environmental impacts of the Proposed Action. Under the No-Action Alternative, and consistent with the NWPA, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate any significant adverse environmental impacts. In addition, DOE would prepare a report to Congress, with the Department's recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage at the generator sites, commercial utilities and DOE would have to continue managing spent nuclear fuel and high-level radioactive waste in a manner that protected public health and safety and the environment. However, the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain was not approved is uncertain.

DOE recognizes that a number of possibilities could be pursued, including continued storage of spent nuclear fuel and high-level radioactive waste at existing sites and/or one or more centralized locations, study and selection of another location for a deep geologic repository (Chapter 1 identifies the process and alternative sites previously selected by DOE for technical study as potential geologic repository locations), the development of new technologies (for example, transmutation), or reconsideration of alternatives to geologic disposal. The environmental considerations of these possibilities have been analyzed in other contexts in other documents to varying degrees.

In light of these uncertainties, DOE decided to illustrate the possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios–long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years (Scenario 1), and long-term storage with no effective institutional control after about 100 years (Scenario 2). Although the Department agrees that neither of these scenarios is likely, it selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur.

9.1 (8386)
Comment - EIS001023 / 0002
The Department of Energy claims that the commercial and Department of Energy sites would remain under effective institutional control for at least 10,000 years. I honestly cannot believe the pretentiousness of the claim.

Response
DOE recognizes that both No-Action scenarios are unlikely. However, the Department selected these scenarios because it did not want to speculate on future actions that Congress could take if there was no recommendation of Yucca Mountain as a repository. DOE selected these scenarios to provide a basis for comparison of impacts from the Proposed Action and to reflect a range of impacts that could occur.

9.1 (8486)
Comment - EIS000817 / 0152
P. 7-16. What do you mean, "The No-Action Alternative assumes that the spent nuclear fuel and high level waste could be treated, packaged, and stored in a condition ready for shipment to a repository"? -- Do you mean it should all be in shipping casks? Then "storage only" casks should be unloaded and put in transport casks now. Not left on the pads. The concern is that we don't know what to expect for sure when we open these casks in 20, 40 years. Can the fuel actually be transported after long term storage at a reactor? Maybe its "condition" will no longer allow it to travel on our roads and rails.

Response
The term "ready for shipment" means that the spent nuclear fuel and high-level radioactive waste would have been treated (in the case of high-level radioactive waste), processed (in the case of some DOE spent nuclear fuel), and packaged in a stable configuration in dry, stainless-steel storage canisters until it was time to transport them to a repository. Section 7.2 of the EIS describes these storage configurations. The No-Action Alternative assumes that the dry storage canisters would be loaded in shipping casks just before transport to the repository.

Licensed spent nuclear fuel dry storage systems are in operation at more than 10 nuclear powerplants across the United States, and are planned at others. The systems assumed for this analysis include stainless-steel canisters loaded with spent nuclear fuel in large structures designed to withstand environmental conditions for 40 years or longer without change in their safety and operational characteristics. With the exception of reductions in temperature and the radioactivity of the spent nuclear fuel over time, DOE does not expect that the storage canisters or their contents would change measurably. DOE assumes that the canisters could be handled and loaded directly into transportation casks – thus, in a condition ready for shipment.

Regarding knowledge necessary to handle and unload storage canisters after long-term storage, along with other information that must be provided to the Nuclear Regulatory Commission, licensees must demonstrate, as a condition of licensing, procedures they can use for handling, loading, and unloading the canisters. The Commission has addressed potential environmental impacts for dry storage systems (DIRS 147915-NRC 1991; DIRS 101899-NRC 1996) and concluded that long-term effects to nearby environments, including effects of direct radiation and skyshine (radiation scattered off air molecules), would be small. Nevertheless, to support their applications for licenses to store spent nuclear fuel, applicants must provide to the Commission technical information demonstrating that no gross degradation would occur while spent nuclear fuel is in storage.

Based on the information discussed above, DOE is confident that the integrity of spent nuclear fuel stored at commercial nuclear reactor sites for long periods would be satisfactory for transportation to a repository at Yucca Mountain and, if required, temporary storage prior to disposal.

9.1 (8488)
Comment - EIS000817 / 0154
P. 7-17. I'm not so very sure as you are that dry storage is the preferred answer. We may need to revert back to pools. The rosy picture you paint of dry storage safety, etc. may not prove to be accurate over time. Dry storage is only in its infancy. No utility has really had to deal with numerous full cask arrays on pads yet -- especially in bad weather. Surrey, I suppose, has the most. There are concerns about snow and ice at Trojan -- the VSC-24 [Ventilated Storage Cask, Model No. 24] was originally designed with a snow shield, but the shield blocked inlets too much, so the shield was eliminated. But snow can block inlets, and icicles can cover outlets (that happened once

at Pt. Beach and at Ft. St. Vrain). Imagine a blizzard and then melting icecaps on each cask in several pads full of casks -- those outlets and inlets need to be open. Outlets will not work as inlets if inlets are blocked. These are things to think about in the future too.

Are fuel rods, as you say, really "likely" to be environmentally "secure" for long periods of time? Is dry storage really "safe"? "Economical"? Is low level waste generated really "minimal"? Is dry storage really "simple" and "easy" to maintain? Better take a closer look at what really is happening with dry storage right now -- the repeated blunders cost money. Is having to UT [ultrasonically test] casks on the pad simple? Easy? No way. Think again. Dry cask storage could maybe be all those things -- but so far the track record is a mess. Make sure you know what NRC [Nuclear Regulatory Commission] is doing. What happens to that spent fuel at reactors now will affect the DOE program. You know it will, yet I think there is certainly not enough communication or interest in this issue between NRC, DOE, and NWTRB [Nuclear Waste Technical Review Board]. You have got to include dry cask storage issues at reactors now, and in the future, in your analysis. Look at reality. Studies predict -- they don't tell you the actual situation. DOE needs to know what's going on.

Response
At present, most commercial nuclear powerplant sites store their spent nuclear fuel in water-filled basins (fuel pools) at the reactors. However, because they have inadequate storage space, some of the sites have built independent spent fuel storage installations, in which they store spent nuclear fuel dry in above-ground metal casks or welded canisters inside reinforced concrete storage modules. Other commercial sites plan to build independent spent fuel storage installations so they can proceed with the decommissioning of their nuclear plants and termination of their operating licenses (for example, the Rancho Seco and Trojan plants). Because commercial sites could elect to continue operations until their fuel pools became full and then cease operations, the EIS analysis initially considered ongoing wet storage in existing fuel pools to be a potentially viable option for spent nuclear fuel storage. However, dry storage is almost certainly the preferred option among regulators and the industry for long-term spent nuclear fuel storage at commercial sites for the following reasons (see Section 7.2 of the EIS):

- Dry storage is a safe, economical method of storage.
- Fuel rods in dry storage are likely to be environmentally secure for long periods.
- Dry storage generates minimal, if any, low-level radioactive waste.
- Dry storage units are simpler and easier to maintain.

As licensees under 10 CFR Part 72, the commercial utilities are responsible for assuring that quality assurance programs (including vendor programs) and technical specifications comply with the site-specific license conditions. DOE believes that the most likely option for long-term storage at reactor sites would be dry storage and, thus, that is the scenario evaluated for the No-Action Alternative.

9.1 (8494)
Comment - EIS000817 / 0156
P. 7-28. The top paragraph is of interest -- DOE did not want to overestimate impacts from repackaging -- I don't even know what you would base this on anyway as it hasn't been done.

Response
In Section 7.2.1.7.3 of the EIS, DOE acknowledges that there is no experience on which to base an analysis of potential air quality impacts resulting from repackaging material removed from dry storage canisters. The Department did not want to speculate on the rate and extent of canister degradation because the rates are likely to be very site-specific. In addition, DOE did not want to overestimate the impacts for the No-Action scenarios. However, DOE believes that any impacts to air quality from repackaging are likely to be small.

9.1 (8608)
Comment - EIS001256 / 0007
The DEIS calculates the maximum potential dose from the underground testing inventory to be 0.2 millirem per year at 20 kilometers. (Section 8.3, page 8-76). We question how this dose was arrived at. How did the Yucca Mountain project get access to the underground testing radiological source term inventory, when the information is classified and not available yet to the UGTA [Underground Testing Area] program? Did you take each nuclear test

inventory separately or did you group the Pahute Mesa inventory together and take the summary? This calculation is inadequate because it seems to base on mostly speculation.

The DEIS states that no radioactive contamination attributable to underground tests has been detected in monitoring wells off the Nevada Test Site [NTS]. (Section 8.3, page 8-76). Absence of evidence is not evidence of absence. There is no state of the art monitoring system on or off the NTS, because no one has constructed one. This statement should be regarded as more of a belief and subject to change as more data is collected over the next decade.

It is highly likely that underground test contamination is past the NTS boundary, because that is exactly what personnel from the DOE UGTA program said at a Community Advisory Board meeting almost four years ago in June 1996. The phenomenon of prompt injection has probably blown the radionuclides past the NTS boundary, in a manner similar to the way it probably blew Europium 0.8 miles at Benham with a colloidal boost. DOE cannot afford to prove or disprove that contamination is past the NTS boundary, but Yucca Mountain could fund a well program to help make this statement more factual.

Response
In 1996, DOE published the *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada* (DIRS 101811-DOE 1996). This document provided an estimate of the underground testing radionuclide source term that is the best available, unclassified, source-term information currently available. This data was used in a simplified calculation to provide a reasonably conservative estimate of potential long-term cumulative impacts resulting from the underground testing activities at the Nevada Test Site. Because of ongoing studies and the current uncertainty surrounding groundwater transport models, the Department did not attempt to estimate actual groundwater transport characteristics for the Nevada Test Site. Rather, the estimates of potential Nevada Test Site groundwater impacts provided in Section 8.3 of the Draft EIS were based simply on the ratio of inventories of radionuclides available for transport at the repository and the Nevada Test Site.

For the Final EIS, the Department has refined the Nevada Test Site groundwater impact analysis to consider not only the total inventories of radionuclides but also the relative source-term radionuclide concentrations and dilution factors for the repository and the Nevada Test Site. However, because of the large uncertainties remaining, the refined analysis did not attempt to model actual groundwater transport at the Nevada Test Site. Instead, the refined analysis assumed that the radionuclide constituents in the groundwater at the Nevada Test Site would be transported in an identical manner to those from the repository (that is, the repository groundwater transport model was applied to the Nevada Test Site source term). In doing so, the Department believes that the resulting estimates of the potential cumulative impacts from underground testing activities at the Nevada Test Site represent a reasonable upper bound of the actual impacts.

With regard to the commenter's concern about the adequacy of the Nevada Test Site Underground Testing Area groundwater characterization program, DOE continues to evaluate, outside of this EIS, the extent of contamination due to past underground testing and refine the monitoring network based on the results of this evaluation. This will provide a better understanding of the current distribution and extent of contaminated groundwater as well as the transport characteristics (including colloidal behavior) of the unsaturated soils and underlying aquifers. As new information becomes available, the Department will update impact estimates as appropriate.

9.1 (8646)
Comment - EIS000817 / 0196
P. K-25. The freeze-thaw cycle effect on dry cask storage needs more evaluation. We have been concerned about it for years.

Response
While the freeze-thaw cycle is a potential concern for the longevity of dry storage casks made of reinforced concrete and exposed to the elements, there would be no effect on the contents of the casks because they would be dry and emit large amounts of heat. Thus the casks would not experience the freezing and thawing. Nevertheless, the cladding integrity of spent nuclear fuel in these types of storage environments is being and would continue to be evaluated.

9.1 (8882)
Comment - EIS001834 / 0023
The "No-Action Alternative" is unrealistic and does not provide a baseline to which the proposed action can be compared. This section should either be entirely deleted from the DEIS, or a real no-action alternative should be described.

The "No-Action" alternative presented is not truly a no-action scenario. It would require action by the federal government to take control of the nuclear waste on the reactor sites and monitor it for at least one hundred years. The true no-action alternative would be to require the utilities to be responsible for safe storage of the waste on the reactor sites until an alternate sound solution is discovered. Although this scenario would raise some safety and environment concerns, it would be a truly "no-action" alternative, and would provide a better comparison model than the scenarios currently described in the DEIS.

Further, it would be possible for the DOE to propose other alternatives that would not be "no-action" alternatives (i.e., other actions). It is clear that the DOE is legally prohibited from looking at other repository sites, but it is not prohibited from looking at alternatives to repository sites. Although Public Citizen does not currently endorse any proposals currently in circulation, we do support continued research in this area and focused efforts to find a true solution.

Response
DOE analyzed the No-Action Alternative to serve as a basis for comparing the magnitude of potential environmental impacts of the Proposed Action. Under the No-Action Alternative, and consistent with the NWPA, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate any significant adverse environmental impacts. In addition, DOE would prepare a report to Congress, with the Department's recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage at the generator sites, commercial utilities and DOE would have to continue managing spent nuclear fuel and high-level radioactive waste in a manner that protected public health and safety and the environment. However, the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain was not approved is uncertain.

DOE recognizes that a number of possibilities could be pursued, including continued storage of spent nuclear fuel and high-level radioactive waste at existing sites and/or one or more centralized locations, study and selection of another location for a deep geologic repository (Chapter 1 identifies the process and alternative sites previously selected by DOE for technical study as potential geologic repository locations), the development of new technologies (for example, transmutation), or reconsideration of alternatives to geologic disposal. The environmental considerations of these possibilities have been analyzed in other contexts in other documents to varying degrees.

In light of these uncertainties, DOE decided to illustrate the possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios–long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years (Scenario 1), and long-term storage with no effective institutional control after about 100 years (Scenario 2). Although the Department agrees that neither of these scenarios is likely, it selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur.

Based on regulations and directives that govern the safe and secure storage of spent nuclear fuel and high-level radioactive waste, under the No-Action Alternative commercial utilities and DOE sites would have to continue to manage these materials in a manner that protects public health and safety and the environment (that is, maintain the status quo). This is the assumption DOE used to evaluate Scenario 1 and the first 100 years of Scenario 2.

The NWPA directs DOE to perform detailed evaluations of the Yucca Mountain site and states that the Department need not consider alternatives to a Yucca Mountain Repository [Section 114 (f)(2)]. However, if the site was not approved, DOE would not proceed with development activities at Yucca Mountain. Rather, as directed by the NWPA [Section 113(c)(3)], the Department would prepare a report to Congress with its recommendations for

further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority.

9.1 (9175)
Comment - EIS001971 / 0005
OTHER PROBLEMATIC ASSUMPTIONS (appendix K, & section 7): The structure of the analysis of the no-action alternative is built upon a series of hypothetical 'assumptions' for 'consistency' or 'purpose of analysis'. While this is an understandable strategy, it cannot be used to entirely evade analysis of the situation that the no-action alternative would actually create, which is 72 de-facto, at reactor storage sites with high exposures to water and people for an indeterminate period of time. Nor is it likely that other assumptions of the no-action analysis will be met (e.g.) "1) that the spent fuel and high level radioactive waste would be treated, packaged and stored in a condition ready for shipment to a repository" and that 2) a double barrier of cask and concrete storage module.

Response
DOE recognizes that the No-Action Alternative does not represent actual conditions at each of the 77 sites, but believes that the two scenarios present a range of impacts that could occur and represent an adequate basis for comparison to the impacts of the Proposed Action.

The No-Action Alternative analysis evaluated environmental impacts for the 77 sites based on National Environmental Policy Act documents prepared by DOE and the Nuclear Regulatory Commission that describe site-specific and "typical" storage configurations for facilities in operation or planned for the near future (DIRS 101898-NRC 1991; DIRS 101899-NRC 1996; DIRS 103191-DOE 1994; DIRS 103214-DOE 1996; DIRS 101802-DOE 1995; DIRS 155929-Jason 1999).

These documents, in addition to describing likely storage configurations (which DOE used to evaluate the No-Action Alternative), evaluated and discussed environmental impacts associated with stabilizing waste materials in preparation for onsite storage. In most cases, the stabilized waste forms are "road ready." Therefore, in accordance with Council on Environmental Quality regulations (40 CFR 1502.20 and 1502.21), DOE decided not to include impacts from stabilization of waste forms except by reference.

This dual-barrier concrete storage modular design is currently licensed by the Nuclear Regulatory Commission and employed at several sites.

9.1 (9229)
Comment - EIS001971 / 0006
The assumption that 10,000 years of institutional control is even a possibility is vain and vacuous; the D.E.I.S. does not even attempt to explain how it might be possible. And an analysis where "the long term impact analysis used recent climate and meteorological data, assuming they would remain constant throughout the evaluation period," is completely incredible. The D.E.I.S. offers this rejoinder:

"DOE recognizes that there could be considerable changes in the climate over 10,000 years (precipitation patterns, ice ages, global warming, etc.) but, to simplify the analysis, did not attempt to quantify climate changes" (at K-3)

Response
DOE recognizes that both No-Action scenarios are unlikely, just as losing effective institutional control after 100 years is unlikely (Section 2.2 and the introduction to Chapter 7 of the EIS). The Department selected these scenarios because it did not want to speculate on future actions that Congress could take if there was no recommendation of Yucca Mountain as a repository and because predicting a date for loss of institutional control would be speculative. The Nuclear Regulatory Commission and the Environmental Protection Agency have recognized this fact and, although they encourage the maintenance of monitoring and physical oversight for as long as possible, they recognize that projecting society's willingness and ability to provide such a function for more than 100 years into the future is not reasonable (see 40 CFR Part 197 and 10 CFR Part 63).

DOE selected these scenarios to provide a basis for comparison of impacts from the Proposed Action and to reflect a range of impacts that could occur. DOE does not believe either scenario is likely to occur. Scenario 1, which includes an analysis of impacts under effective institutional control for at least 10,000 years, is consistent with the

portion of the analysis of the Proposed Action that includes an analysis of effective institutional control for the first 100 years after closure. Scenario 2, in which the analysis does not consider effective institutional control after approximately 100 years, is parallel to the portion of the Proposed Action analysis in which long-term performance after 100 years does not include effective institutional control.

For consistency with the repository analysis in the *Viability Assessment for a Repository at Yucca Mountain* (DIRS 101779-DOE 1998), the No-Action Alternative assumed constant climatology during the 10,000-year analysis period. This is consistent with climate studies that show the Yucca Mountain area is at most 35,000 years into a fluctuation between a cold glacial climate and a warm interglacial climate (similar to the present), which occurs about every 100,000 years (DIRS 101779-DOE 1998). DOE discusses the difficulties of modeling these changes and the potential effect on outcomes resulting from uncertainties associated with predicting future climatic conditions in Section K.4.1.2 of the EIS.

9.1 (9284)
Comment - EIS001971 / 0017
As the 'test of common sense' illustrates, the most difficult aspect of trying to respond formally to the no-action alternative in the context of the draft E.I.S for Yucca Mountain is that it really does not 'make sense.' The conclusion of 'no impact' for the no-action alternative simply eluded my most tenacious attempts to understand the process by which this conclusion was reached. Internal contradictions are fundamental; assumptions evade both the current reality of the no-action alternative and the very scenarios that are posited by the alternative.

The 'belief' of the drafters of the E.I.S., given to frame the no-action alternative, is perhaps the most problematic of all: that neither of the no-action alternatives is likely to happen. From the perspective of those of us living in the vicinity of ad hoc interim at-reactor-site storage, which would become defacto permanent storage under either an official no-action alternative or simply by continued failure on the part of DOE to fulfill its contract, this 'belief' is nonsense. It makes sense ONLY if the structure of the no-action alternative is entirely disingenuous: if what the drafters mean is that it is not likely that a 100 year storage period will be without institutional oversight, and that institutional oversight throughout a 10,000 year period is not likely. This would, of course, be true. But then, the whole structure of the alternative would have been set up to undermine itself. I do not choose to 'believe' that this was the intention – even if it was. I prefer to attribute the disjunction to the human capacity for denial – which has proved to be one of the most abiding factors of nuclear waste policy and politics. This is the fundamental dynamic that we must change.

Response
DOE prepared the EIS to provide information on environmental impacts that could result from the Proposed Action and a basis for comparison in the two No-Action scenarios. As such, the EIS provides estimates of environmental impacts without conclusions on their significance (that is, the EIS has not concluded that the No-Action Alternative would result in "no impacts"). In fact, the EIS presents local impact estimates under Scenario 2 that many would consider quite severe (see Section K.3.1 of the EIS).

DOE believes that both No-Action scenarios are unlikely as a permanent solution even though continued onsite storage of spent nuclear fuel and high-level radioactive waste would be necessary for some time if the site was not approved. If the Secretary of Energy did not recommend Yucca Mountain as a repository, DOE would, in accordance with the NWPA [Section 113(c)(3)], prepare a report to Congress, with the Department's recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage at the generator sites, commercial utilities and DOE would have to continue managing spent nuclear fuel and high-level radioactive waste in a manner that protected public health and safety and the environment. However, the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain was not approved is uncertain.

DOE recognizes that a number of possibilities could be pursued, including continued storage of spent nuclear fuel and high-level radioactive waste at existing sites and/or one or more centralized locations, study and selection of another location for a deep geologic repository, the development of new technologies, or reconsideration of alternatives to geologic disposal. The environmental considerations of these possibilities have been analyzed to varying degrees in other contexts in other documents (see the introduction to Chapter 7).

In light of these uncertainties, DOE decided to illustrate the possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios – long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years, and long-term storage with no effective institutional control after about 100 years. Although the Department agrees that neither of these scenarios is likely, it selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur.

9.1 (9321)
Comment - EIS001888 / 0051
EIS Statement (pg. 2-65) 2.2.2.2 - In No-Action Scenario 1, DOE would continue to manage its spent nuclear fuel and high-level radioactive waste in above- or-below-grade dry storage facilities at five sites around the country. Commercial utilities would continue to manage their spent nuclear fuel at 72 sites. The commercial and DOE sites would remain under effective institutional control for at least 10,000 years. DOE based the 10,000-year analysis period on the generally applicable Environmental Protection Agency regulation for the disposal of spent fuel and high-level radioactive waste (40 CFR Part 191), even though the regulation would not apply to disposal at Yucca Mountain.

Clark County Comment - This alternative is not authentic since it posits that institutional controls would remain for 10,000 years at 77 facilities that currently store spent fuel. DOE's alternative for institutional controls should be reasonably comparable. It is not reasonable to compare relaxed standards of the Nuclear Waste Policy Act with a more restricted national standard. Further, under this scenario, storage facilities would be completely replaced every 100 years. This artificially distorts the cost of a "realistic" on site storage for an interim period of 20-50 years while a fair search for an appropriate disposal solution is sought. Further, HLW [high-level radioactive waste] at DOE facilities throughout the country are the responsibility, in perpetuity, of the DOE. Replacement of buildings at these facilities should not be factored into the costs of the No-Action alternative. The spirit of NEPA [National Environmental Policy Act] requires the formulation of realistic scenarios in order to identify alternatives, impacts and potential mitigation strategies. The DEIS fails to meet the spirit and letter of NEPA in this regard. NEPA Regulation: Sec. 1502.14 Alternatives including the proposed action; Sec. 1502.16 Environmental consequences.

Response
DOE analyzed the No-Action Alternative to serve as a basis for comparing the magnitude of potential environmental impacts of the Proposed Action. Under the No-Action Alternative, and consistent with the NWPA, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate any significant adverse environmental impacts. In addition, DOE would prepare a report to Congress, with the Department's recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage at the generator sites, commercial utilities and DOE would have to continue managing spent nuclear fuel and high-level radioactive waste in a manner that protected public health and safety and the environment. However, the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain was not approved is uncertain.

DOE recognizes that a number of possibilities could be pursued, including continued storage of spent nuclear fuel and high-level radioactive waste at existing sites and/or one or more centralized locations, study and selection of another location for a deep geologic repository (Chapter 1 identifies the process and alternative sites previously selected by DOE for technical study as potential geologic repository locations), the development of new technologies (for example, transmutation), or reconsideration of alternatives to geologic disposal. The environmental considerations of these possibilities have been analyzed in other contexts in other documents to varying degrees.

In light of these uncertainties, DOE decided to illustrate the possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios – long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years (Scenario 1), and long-term storage with no effective institutional control after about 100 years (Scenario 2). Although the Department agrees that neither of these scenarios is likely, it selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur.

DOE also believes that any additional effort to perform more specific analyses probably would yield results that contain some combination of the costs and human health effects postulated for the two scenarios evaluated in the EIS and, therefore, would not provide substantive additional information for the decisionmakers.

DOE also believes that the assumptions made about facility replacement every 100 years could, if anything, underestimate the costs because current Nuclear Regulatory Commission regulations (10 CFR Part 72) allow only a 20-year license period for independent spent fuel storage installations.

DOE does not understand the reference to comparison of "relaxed standards of the Nuclear Waste Policy Act with a more restricted national standard." DOE believes that the NWPA and regulatory standards issued by the Environmental Protection Agency and Nuclear Regulatory Commission (40 CFR Part 197 and 10 CFR Part 63, respectively) are at least equivalent to and in many ways more demanding than current standards for independent spent fuel storage installations. In addition, DOE notes that 40 CFR Part 197 specifies a 10,000-year compliance period.

9.1 (9386)
Comment - EIS002149 / 0006
In the no action alternative, there's been a lot of talk about how well, we can't keep the stuff on-site because of all the potential dangers with on-site storage, which -- the on-site no action alternative in this document is -- is not very well addressed, and one of the issues that keeps coming up is oh, there's all this problem with flooding. I looked in this thing and I looked in volume 2 and I didn't really see a flood analysis in there, and I would be happy if you want to point it out to me if it's in there. So if it's such a big problem, then explain how it's a big problem, why it's going to be such a big problem to have on-site storage in areas which are relatively near to water, to water facilities, which is what one of the big arguments I've been hearing. So I'd like to see that addressed in this document, as well.

Response
Chapter 7 of the EIS provides quantitative estimates of environmental impacts from two No-Action scenarios without conclusions as to their significance. In Scenario 1, the spent nuclear fuel and high-level radioactive waste would be maintained for at least 10,000 years. The environmental impacts associated with this scenario would be predominantly to workers associated with ongoing monitoring and maintenance of the storage facilities. The analysis assumed that the storage facilities would be built at existing nuclear facility sites, where flooding is not an issue.

In Scenario 2, the storage facilities would again be at existing nuclear facility sites, but there would be no institutional control (ongoing monitoring and maintenance) after 100 years. As the concrete storage facilities, storage canisters, and spent nuclear fuel and high-level radioactive waste materials deteriorated, contaminants would enter surface waters from stormwater runoff from failed facilities and storage containers and exposed radioactive materials. Sections 2.2.2, 7.2.1, and 7.2.2 of the EIS describe the scenarios further. DOE is unaware of any implication of flooding as an issue for the No-Action scenarios unless the reference is to eventual widespread contamination of surface-water bodies from the stormwater runoff mentioned above.

9.1 (9756)
Comment - EIS001888 / 0339
[Clark County summary of comments it has received from the public.]

The No Action Alternative should include activities in addition to stopping work at Yucca Mountain and Continued storage of SNF [spent nuclear fuel] and HLW [high-level radioactive waste] at the generator sites. Other activities to be evaluated include: (1) long term storage and maintenance of SNF and HLW (also Greater than Class C), (2) the development and use of dry cask storage, (3) phaseout and replacement of nuclear power with alternative sources, (4) all SNF and HLW (not limited to 70,000 MTHM [metric tons of heavy metal]), and (5) site-specific activities (e.g., closure dates, handling options, onsite storage, SNF/HLW inventory). Several commenters stated that the No Action Alternative should not include discussions of the future of the nuclear energy industry, including future construction and operation. Some commenters stated that the No Action Alternative must be part of the EIS, while other commenters stated that the No Action Alternative should not be part of the EIS because it was not part of Congress's intent. One commenter stated that the No Action Alternative should be the only alternative evaluated in the EIS.

Response
Responses to the various points in this comment are numbered in accordance with the numbers in the comment.

Items 1 and 4. Section 7.3.2 of the EIS evaluates continued storage at the 77 existing sites of all spent nuclear fuel and high-level radioactive waste (called Inventory Module 1; see Table 7-9 in Section 7.3). Section 7.3.2 describes short- and long-term impacts at commercial and DOE sites. DOE has not included Module 2 in its consideration of potential impacts under the No-Action Alternative because not enough information about Module 2 wastes is available to enable a meaningful analysis. For example, materials such as sealed radioactive sources, calibration, medical, and well-logging sources are used and stored by private industry at hundreds of locations in the United States (DIRS 101798-DOE 1994). Environmental information at the hundreds of sites at which Greater-Than-Class-C and Special-Performance-Assessment-Required low-level radioactive wastes are used and stored is not readily available. Although specific analysis is not possible, DOE believes short-term impacts such as those to socioeconomics and land use would not increase appreciably, but health effects could increase over the long term because workers and the public could be exposed to these waste types.

Item 2. Regarding the development and use of dry cask storage at the 72 commercial storage sites, DOE points to the Nuclear Regulatory Commission's findings in its *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (DIRS 101899-NRC 1996). The Commission stated: "Within the context of a license renewal review and determination, the Commission finds that there is ample basis to conclude that continued storage of existing spent fuel and storage of spent fuel generated during the license renewal period can be accomplished safely and without significant environmental impacts." Although applicable only to the continued storage of spent nuclear fuel generated up to and through the 20-year license renewal period for the nuclear powerplants, DOE believes the conclusions remain valid for much longer periods assuming that current institutional controls and regulatory frameworks (for example, 10 CFR Part 72) continue. Dry cask storage is and will continue to be an option for nuclear utilities to safely manage spent nuclear fuel until ultimate disposal.

Item 3. Speculation regarding the phaseout of nuclear power and replacement with alternative energy sources is beyond the scope of this EIS. DOE has revised the introduction to Chapter 7 of the EIS to discuss some of the potential impacts that could result from the phaseout of nuclear powerplants. This section also identifies the actions required of DOE by the NWPA to determine alternative means to ensure safe, permanent disposal of spent nuclear fuel and high-level radioactive waste if a decision was made not to proceed with the development of a repository at Yucca Mountain. The NWPA does not contain provisions concerning any phaseout of nuclear power.

Item 5. Section 2.2 of the EIS describes the No-Action Alternative and rationale for selection of scenarios for analysis. Chapter 7 and Appendix K contain the details of the analysis and results.

9.1 (10124)
Comment - EIS001295 / 0005
Section 7.2.1.13 on environmental justice effects of the so called "no-action" scenario is also severely lacking in attention to the justice issues which are involved in NOT moving this waste. If Yucca Mountain is not used, yet the DOE requires that the waste be moved away from the sites where it has been generated, someone, somewhere will have to become the new, probably unwilling host to an HLRW [high-level radioactive waste] disposal facility. The "no-action" scenario #1 attributes no positive aspect to the justice exhibited when those communities which have been responsible for creating the waste are the same communities which stand guard over the waste into the foreseeable future and beyond.

No positive aspect of the "no-action" scenario #1 is attributed to the salvation of possible transportation accidents, unplanned exposures, diminished land values along transportation routes and the most unfortunate ruining of the Yucca Mountain location and surrounding urban areas at Las Vegas, Los Angeles and elsewhere by the placement of this waste there. The negative impacts in terms of environmental justice issues are much greater in fact if the waste is removed from where it is currently located, shipped through urban, often poor communities next to railroad tracks and highways, and dumped into a hole out back on the Indian reservation as planned at Yucca Mountain. The "no-action" scenario #2 is absolutely irresponsible, but a highly likely scenario given the nature of the nuclear industry and the regulating community. It is important that the people of the United States, their government, the DOE and the commercial utilities not allow this scenario to develop in a de facto manner. We all have a responsibility to monitor their actions so as not to allow it to develop. Collectively, the world population and the

more responsible governments of the world have a responsibility to prevent this scenario from developing within this country and elsewhere on our planet.

Section 7.3.2.7 claims that the employment of personnel involved with construction and maintenance of 77 facilities is the only contributing factor in socioeconomic impacts due to on site storage. I would comment that the potential of collective public responsibility for the safeguarding of these wastes for the time period considered would allow the creation of much greater socioeconomic impact. Participation in the activity of oversight, construction and maintenance of the storage facilities beyond the previously mentioned 100-year planned obsolescence, the possibility of tourism and pilgrimages; and educational and interpretational opportunities to understand and contemplate the profoundly deep social and economic commitment that human ancestors made to nuclear technology and the ongoing efforts of current generations to keep its waste products from contaminating the planet could have enormous social, economic and political impacts which are not even alluded to in the DEIS. Furthermore, the actual economic impact of the "no action" scenario #2 (basically ignoring the problem and burying the waste onsite) is not elaborated upon, and would include immediate short term economic benefit to the DOE, the public and the commercial utilities - this aspect of the problem, the potential unprofitability of dealing with this waste, contributes to the notion that Yucca Mountain is the only answer, because the utilities and waste handling contractors are already lined up at the trough like pigs. To address this waste problem involves huge economic subsidies by the people through their government, which would employ at great expense large nuclear industry contractors to hire low-cost workforces who would then build railroads, drive trucks and engineer casks and carriages and shuffle the waste around the country. The potential for local economic development in finding ways to collectively and democratically secure and isolate these wastes well into the future is great, yet the DEIS fails completely to explore it.

In summary, I do not think that the two scenarios for so-called "no action" are at all similar, and are not developed adequately to fully understand what the impact of long-term population-wide maintenance of the isolation of these wastes mean. I think that this failure to create a reasonable scenario for long term on site storage allows no adequate comparison to the environmental impact of transportation and storage of this waste at Yucca Mountain and I would request that more investigation be done on the possibility of long-term on site or near on site storage where the population as a whole is involved in the process of maintaining the isolation of these wastes from the environment.

Response

DOE does not believe that this alternative would result in beneficial impacts to the Nation as a whole. On the contrary, the No-Action Alternative would have potentially severe detrimental environmental consequences.

The National Environmental Policy Act process defines the No-Action Alternative as providing a benchmark, enabling decisionmakers to compare the magnitude of environmental effects on the action alternatives ["Forty Most Asked Questions Concerning National Environmental Policy Act Regulations" (46 *FR* 18026, March 21, 1981), Question and Answer No. 3]. The Council on Environmental Quality defines the No-Action Alternative as "no change" from current direction (that is, conditions that would result if the Proposed Action did not happen). Using the example of nationwide transportation, the No-Action impact assessment would compare potential transportation impacts (adverse or beneficial) to existing impacts. Because no transportation activities are under way related to the disposal of spent nuclear fuel and high-level radioactive waste and the No-Action Alternative assumed no transportation would occur, the net transportation impacts associated with the No-Action Alternative would be zero. The analysis captured transportation impacts for the Proposed Action by comparing them to the benchmark provided by the No-Action Alternative (that is, zero). Chapter 6 of the EIS discusses transportation impacts from the Proposed Action.

DOE believes that both No-Action scenarios are unlikely, even though continued onsite storage of high-level radioactive waste and spent nuclear fuel would be necessary for some time if the Yucca Mountain site was not approved. If DOE did not recommend Yucca Mountain, it would, as directed by the NWPA [Section 113(c)(3)], prepare a report to Congress with its recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority.

As noted by the comment, DOE estimated the workforce impacts associated with the No-Action Alternative. This estimate included construction, oversight, and maintenance activities. On the other hand, the Department cannot speculate on the possible role of generator sites as tourism or educational destinations. Commercial utilities, as

nuclear plant operators under Nuclear Regulatory Commission regulations, determine the scope of public outreach and interpretive programs provided at their nuclear facilities. DOE believes that this level of activity does not provide discriminating information for the decisionmakers.

The costs associated with the Proposed Action would be greater during the first 100 years; the ongoing costs associated with continued storage under Scenario 1 would be far greater. Most of the funding for repository investigation and development comes from ratepayers who benefit directly from the use of nuclear power. In addition, ratepayers would fund continued storage of spent nuclear fuel at generator sites. The EIS analysis assumed that facilities would require replacement every 100 years, and that there would be a major facility repair halfway through the first 100-year cycle. Under Scenario 2, the projected economic impacts would be the same as those for Scenario 1 for the first 100 years, but after that approximately 800 jobs would be lost.

9.1 (10431)
Comment - EIS001927 / 0036
How about the "No Action Alternative" of phasing out nuclear power?

Response
In accordance with the NWPA, the EIS evaluates the Proposed Action to construct, operate and monitor, and eventually close a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at the proposed Yucca Mountain Repository. The No-Action Alternative evaluated in the EIS is continued storage of spent nuclear fuel and high-level radioactive waste at generator sites, or maintenance of the status quo.

Speculation on the phaseout of nuclear power and replacement with alternative energy sources is beyond the scope of this EIS. DOE has revised the introduction to Chapter 7 of the EIS to discuss some of the potential impacts that could result from the phaseout of nuclear powerplants. This section also identifies the actions required of DOE by the NWPA to determine alternative means to ensure safe, permanent disposal of spent nuclear fuel and high-level radioactive waste if a decision was made not to proceed with the development of a repository at Yucca Mountain. The NWPA does not contain provisions concerning any phaseout of nuclear power.

9.1 (10662)
Comment - EIS001966 / 0002
In the No Action Alternative section, there is the statement that the drafters of the EIS do not believe either of the No Action Alternatives are likely to happen. However, the drafters give no reasons for this assumption. If this assumption is going to be made, it must be substantiated. In my opinion, this is the most likely event because thus far, there has been no DOE action and Secretary Richardson has recommended that the DOE take title on site, relieving the federal government of its duty and relieving the utilities of their potential liability.

Response
DOE analyzed the No-Action Alternative to serve as a basis for comparing the magnitude of potential environmental impacts of the Proposed Action. Under the No-Action Alternative, and consistent with the NWPA, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate any significant adverse environmental impacts. In addition, DOE would prepare a report to Congress, with the Department's recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage at the generator sites, commercial utilities and DOE would have to continue managing spent nuclear fuel and high-level radioactive waste in a manner that protected public health and safety and the environment. However, the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain was not approved is uncertain.

DOE recognizes that a number of possibilities could be pursued, including continued storage of spent nuclear fuel and high-level radioactive waste at existing sites and/or one or more centralized locations, study and selection of another location for a deep geologic repository (Chapter 1 identifies the process and alternative sites previously selected by DOE for technical study as potential repository locations), the development of new technologies (for example, transmutation), or reconsideration of alternatives to geologic disposal. The environmental considerations of these possibilities have been analyzed in other contexts in other documents to varying degrees.

In light of these uncertainties, DOE decided to illustrate the possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios–long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years (Scenario 1), and long-term storage with no effective institutional control after about 100 years (Scenario 2). Although the Department agrees that neither of these scenarios is likely, it selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur.

9.1 (10669)
Comment - EIS001966 / 0009
Because the siting guidelines require consideration of many factors in siting a repository, including natural resources, hydrology, geophysics, seismic activity, population characteristics, socioeconomic factors, and transportation, under NEPA these specific factors must also be considered in the "No Action Alternative," where on-site storage at nuclear generation plants is said to be an Alternative.

Response
Although the same degree of rigor was not comparable for all areas of environmental impacts, the same spectrum of impacts was considered for the Proposed Action and the No-Action Alternative. In accordance with Council on Environmental Quality regulations [Section 1501.7(a)], as part of the scoping process DOE identified the significant issues to be analyzed in detail in the EIS. DOE was also able to identify and eliminate from detailed study the issues that were not significant or that have been covered by prior environmental review (Section 1506.3). In doing so, it narrowed the discussion of these issues in the EIS to a qualitative or semi-quantitative presentation, including a statement of why they would not be expected to adversely affect the human environment.

DOE then identified the environmental impact areas associated with important issues that were common to both the Proposed Action and the No-Action Alternative. These common areas (occupational and public health and safety, and hydrology) received detailed evaluation under the No-Action Alternative.

9.1 (11152)
Comment - EIS000278 / 0002
The DEIS evaluates two scenarios of what is called the no-action alternative, which it says provides a baseline for comparison with proposed action. In both scenarios, storing waste at the plant sites for 10,000 years, scenario one; and storing waste at the plant sites for 100 years, scenario two, the spent fuel remains at the plant sites. Currently more than 38,500 metric tons of uranium are stored on site at 72 commercial nuclear power plants in 36 states. Additional high-level radioactive waste is stored at five DOE sites. In scenario one, the waste remains at the current sites under institutional controls for 10,000 years with repackaging approximately every 100 years. Nearly five trillion dollars would be required for canister replacement. According to the cost estimates in the DEIS, this scenario is double the cost of storing the waste on site for 100 years under institutional controls, scenario two. In human terms, an additional three latent cancer deaths would occur in the exposed population and 28 additional latent cancer deaths in the population of on-site workers. This is substantially more radiation-related cancer deaths than occur if the repository is completed in the Yucca Mountain site.

Scenario two is not as financially burdensome. Waste remains at the plant sites under institutional controls for only 100 years, but the waste still remains at the plant sites for 10,000 years. For the first 100 years, the costs of scenario one and two are the same. However, the number of people who would be affected by the migration of radioactive materials is far greater. In scenario two, additional latent cancer deaths in the exposed population increase to 3,300 with 12 additional latent cancer deaths in the on-site worker population. Such high numbers of latent cancer deaths are unacceptable.

Response
This comment accurately summarizes the estimated impacts for the No-Action Alternative. The Secretary will consider all information, including the estimated number of latent cancer fatalities, for both the Proposed Action and the No-Acton Alternative in determining whether to recommend the Yucca Mountain site to the President for further development.

9.1 (11607)
Comment - EIS001654 / 0037
Page S-66. Table S-1 Needs More Clarity of the Meaning of the Data it Displays

Just as we felt the major findings of the EIS in S.11 needed more emphasis, Table S-1 needs some improvement because it is the summary display of the supporting evidence that led to the findings.

For example, the impact on hydrology for the Scenario 2 is more than just "Potential for radiological contamination of groundwater around 72 commercial and 5 DOE sites." Is it not a certainty that there will be contamination in that scenario if the spent fuel and other waste are left unmanaged over the 9,900 years after institutional controls no longer exist?

We find some difficulty (and assume others do) in interpreting the data displayed to represent the long-term consequences in occupational health and safety for the Proposed Action and the Scenario 2 No-Action Alternative. The Latent Cancer Fatalities (LCF) for the Maximally Exposed Individual (MEI) and population are 4.4×10^{-5} and $5.3 \times l0^{-4}$ for the Proposed Action compared to death within a few months for MEI and a population of 3,300 for Scenario 2 with a footnote that "downstream exposed population of approximately 3.9 *billion* over 10,0.90 years." (emphasis added) We conclude that there is a very slight radiological risk over 10,000 years under the Proposed Action. That compares with thousands of deaths with No-Action Scenario 2 and billions of people potentially exposed "downstream." If we have interpreted that even correctly, it should be presented more boldly in the Summary. If we have drawn an incorrect conclusion, then maybe others will and the table should be revised to prevent misinterpretation.

Response
DOE believes that contamination would probably occur at most of the 77 sites if they were left unmanaged for 9,900 years. However, excluding possible damage from manmade external events or severe natural phenomena, the Department's evaluations of environmental concrete degradation for some regions of the United States predict that the above-ground storage modules could maintain their integrity longer than 10,000 years, thus preventing the release of radioactive material to the accessible environment during the period of evaluation.

Regarding the presentation of the latent cancer fatalities in Table S-1 in Section S.11.1 of the EIS, the Department believes the presentation is sufficient and has made no related changes to the table.

9.1 (12711)
Comment - EIS001337 / 0084
Page 2-75 Table 2-7 [Section 2.4.1]. This table should be revised to include a comparison of the population likely to accrue the risks associated with the No Action and Preferred alternatives. For example, what is the number of persons potentially exposed to risks associated with the No Action Alternative (ie., population near on-site storage and transportation routes). This information would be helpful in evaluating the extent to which the alternatives tend to concentrate risks among persons exposed to them. This concentration of risk is an important impact, which must be considered for mitigation or compensation.

Page 2-76 Table 2-7. Under No Action Alternative estimates of Radiological Latent Cancer Fatalities why is not a range of estimates given similar to estimates for the Preferred Alternative. Absent a range, does this imply a lack of uncertainty in the estimates under the No Action alternative, which is not available for the Preferred Alternative. The presentation of comparative data in Table 2-7 for each parameter for each alternative should be consistent.

Page 2-76 Table 2-7. As the analysis in Table 1 of these comments illustrates, the number of fatalities associated with the Proposed Action [and] No Action alternatives. This is due to the fact that transportation is the key source of risk during the first 100 years. This analysis suggests that for at least 100 years the No Action serves to better protect public health and safety. The analysis in Table 1 also suggests that if the Preferred Action is implemented that during the first 100 years there will be a disequitable distribution of risk from existing storage sites to primarily Nevada, and in particular, communities located along transportation routes. The DEIS must consider the temporal and geographic distributions of risk associated with the Preferred and No Action alternatives. The DEIS must consider methods to mitigate risks transferred to Nevada. The DEIS must recognize that the Preferred Action does not minimize risk during the first 100 years of repository operation.

Table 1.
Draft Yucca Mountain Environmental Impact Statement
Comparison of Proposed Action to No Action Alternatives Total Fatalities Per Year
(derived from data in Table 2-7 of Yucca Mtn. DEIS)

Alternative	0-24yrs.	24 yr. Total	25-100yrs.	75 yr. Total	100yr. Total	101-10,000yrs.	9,900yr. Total
Proposed	.75-2.69	18.70-67.13	.04-.06	3.01-4.53	12.70-71.66	5 X 10^{-8}-5.3 X 10^{-8}	5 X 10^{-5}-5.3 X 10^{-4}
No Action #1	.25	6.35	.25	19.06	25.4	.11	1,095
No Action #2	.25	6.35	.25	19.06	25.4	.33	3,300

Table Conclusions[1]

1. During the period 0-24 years Proposed Action is 3-10 times riskier that the No Action alternatives.
2. During the period 25-100 year No Action #1 is 4-6 times riskier than the Proposed Action.
3. During the first 100 years Proposed Action is a little less to nearly three times riskier than No Action alternatives.
4. During the period 101 - 10,000 years No Action Alternative is 1,000 to 3,000 times riskier than the Proposed Action.
5. During first 24 years of repository operation, transportation is the source of over 95 percent of all fatalities, with most being from highway accidents rather than exposure to radiation.

1/ Proposed Action - disposal at Yucca Mountain
No Action Alternative #1 - on-site storage of wastes with long-term institutional controls
No Action Alternative #2 - on-site storage of wastes without long-term institutional controls

Response
DOE agrees that detailed affected population information is important. However, because of space considerations in Chapter 2 of the EIS, this detailed information is in later chapters and technical appendixes (principally Chapter 4 for short-term impacts for the Proposed Action, Chapter 5 for long-term impacts of the Proposed Action, Chapter 6 for transportation impacts, and Chapter 7 for impacts from the No-Action Alternative) rather than in the summary table in Section 2.4.1, which provides a broad overview of impacts.

The range of impacts to which the commenter refers in Table 2-7 was not meant to reflect uncertainty in the estimates, but rather to show the range of impacts of various implementation scenarios. For example, the range of radiological impacts for the repository given in the Draft EIS reflects the differences between the high, intermediate, and low thermal load scenarios. Similarly, the range for transportation impacts reflects the range of impacts for accidents that could occur in areas with low and high population densities.

For the No-Action Alternative, impacts for each of the scenarios evaluated are in separate columns (that is, Short-term, Scenario 1, and Scenario 2), and ranges are, therefore, not shown. However, Section K.4 of the EIS discusses the uncertainties associated with the No-Action Alternative in detail.

The purpose of the EIS is to provide information on the potential environmental impacts that could result from the Proposed Action to construct, operate and monitor, and eventually close a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at the Yucca Mountain site. The repository and transportation analyses have captured the geographic shift of risks, as discussed in Chapters 4 and 6, respectively. Chapter 9 discusses the potential for mitigation of these risks. The EIS also provides information on potential environmental impacts resulting from a No-Action Alternative that assumes that the spent nuclear fuel and high-level radioactive waste would continue to be stored at the generator sites for some time into the future. The EIS does not, however, make judgments on whether the temporal and geographic distribution of impacts is equitable.

9.1 (13109)
Comment - EIS010227 / 0027
The SDEIS indicates that there could be a need for more surface cooling of the fuel assemblies, and suggests building an on-site above ground monitored retrievable storage area. What's the rush to move the fuel if it's just

going to sit in dry casks at Yucca Mountain? Why doesn't the DOE assume responsibility for putting the waste into dry casks at the reactor sites?

Response
The Nuclear Waste Policy Act of 1982 affirms the need and establishes a process for the siting, construction, and operation of a repository that will provide reasonable assurance that the public and the environment will be adequately protected. DOE is obligated to construct, operate and monitor, and eventually close a repository in accord with the provisions of this Act.

If the Secretary of Energy decided not to recommend Yucca Mountain for a repository DOE would prepare a report to Congress with its recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Such legislative authority could include DOE involvement in at-reactor storage activities only if approved and directed by Congress.

9.1 (13371)
Comment - EIS010296 / 0016
Section S-1 S&ER Flexible Design (p.S-2): The DOE proposed [land] surface cooling/aging of waste at the repository site prior to loading may constitute "interim storage." The DOE does not specify how much waste might be aging/cooling at any one time, and that this aging process could be accomplished at the nuclear reactor sites.

Response
Although the flexible design described in the Supplement to the Draft EIS, and carried forward in this Final EIS, includes a surface aging facility for storage of as much as 40,000 metric tons of heavy metal (MTHM) over 50 years, this facility has been proposed as a repository operational option that could provide a cost-effective method of achieving a lower-temperature repository. DOE does not believe that the siting limitations for interim storage facilities contained in the NWPA constrain the operational flexibility of the repository or ultimately the long-term performance of the repository. Therefore, DOE believes that the surface aging facility option constitutes a potential operational element of a proposed repository.

DOE has indicated that 40,000 MTHM would be the maximum size of a surface aging facility at the Yucca Mountain site. Accordingly, the 40,000-MTHM facility was analyzed for the EIS to ensure that the impacts covered the total range possible. However, a surface aging facility as large as 40,000 MTHM might not be required after all aspects of the shipping scenarios, such as the age of the spent nuclear fuel to be shipped first, had been defined.

As discussed in Section 7.3 of the EIS, DOE believes (as does the Nuclear Regulatory Commission), that continued onsite storage of spent nuclear fuel can be accomplished safely and without significant environmental impacts (DIRS 101900-NRC 1996). Therefore, the Department believes that if necessary, utilities could continue to safely store spent nuclear fuel at their sites and the impacts of such storage would be similar to the short-term (100-year) impacts evaluated for the No-Action Alternative (see Table 7-6).

9.2 Accidents

9.2 (6698)
Comment - EIS001632 / 0089
Page K-26, Section K.2.5.2: This section discusses the potential for criticality involving stored spent fuel. EPA agrees with the assessment that criticality for high-level nuclear waste is impossible, but believes the EIS should expand the assessment of low probability for criticality in stored spent fuel canisters. The text states that only water entry, and its retention in the canisters, would allow a criticality to develop; and, the discussion further acknowledges the possibility of degradation of the concrete storage facilities, allowing water entry. Yet, the text does not assess the probability that dripping water could corrode the fuel containers, allowing water to enter and remain there for some time, potentially causing a criticality.

The text discusses three types of criticality events, but does not connect them to more explicit container corrosion failures scenarios or evaluate the relative probabilities of each failure type. DOE should more explicitly analyze corrosion failures (penetration of the container and corrosion of the internal components) from water entering the

storage container and the potential for various criticalities. It is plausible that dripping water could corrode a storage container, allowing water to collect and fill the container (a scenario similar to NRC's performance scenario for a breached waste package in the repository).

Response
DOE agrees that there is some limited potential for a criticality event to occur in degraded spent nuclear fuel canisters. However, DOE believes the discussion in Section K.2.5.2 of the EIS includes the appropriate level of analysis and qualitative description of probability. There are many uncertainties and speculative processes involved in the hypothetical scenario that assumes no effective institutional control after approximately 100 years, as well as the sequence of events that could occur within that scenario. DOE does not believe it is possible to establish defensible probabilities for this No-Action accident scenario or the components of the scenario described in this comment that could lead to potential criticality during extended periods of dry storage with no institutional control (Scenario 2 of the No-Action analysis). Other factors that the analysis would have to quantify to estimate those probabilities would be different climatic conditions around the country, the different types of commercially available dry storage configurations, the range of burnup in the spent nuclear fuel, and the initial enrichment of the fuel.

Rather than specific probability analyses of the impacts associated with this No-Action scenario, the EIS provides qualitative descriptions of the relative likelihood of criticality events. First, the EIS states that criticality could be possible (in degraded storage canisters) if other conditions were met simultaneously. Those other conditions are a configuration that would allow water to enter but not drain out of the storage canister and fuel containing sufficient fissionable atoms to allow criticality. The second condition would depend on initial enrichment and burnup of the fuel. The EIS also states that a small amount of the spent nuclear fuel would be likely to have the appropriate enrichment burnup combinations, which could enable criticality to occur. Three types of criticality events were acknowledged as possible with only the most energetic type having potential to produce large impacts. That event is possible, but highly unlikely. It could happen only if sufficient amounts of fissionable material were brought together suddenly into a critical configuration. The more likely possibility would be for water to build up around degraded fuel elements. If fissions began to occur, the water would boil away and the criticality would stop. As noted in Section K.2.5.2 of the EIS, even the most energetic criticality would be unlikely to exceed the impacts associated with an aircraft crash onto a degraded dry storage module as evaluated in Section K.2.5.1. Therefore, DOE believes that further quantification of the probability of such an event would not provide useful information or be defensible.

9.2 (7769)
Comment - EIS000817 / 0029
Your radiological impact from scenario 1 (no-action) is based on a postulated aircraft crash it says. However I do not see this airplane crash (with fuel fire from the plane) into a full cask array in most safety analysis reports for dry cask designs. Has DOE looked carefully at what NRC and cask vendors are evaluating here? Just what is the scenario? It should be a full cask array and a large jet crash with a full fuel tank fire, and probably a cask pushed into another cask or tipped over, etc. Just what could happen here?

Response
In evaluating existing information on dry cask storage accidents, DOE did not find any reference to aircraft crashes on dry cask storage arrays. However, as noted in Section K.2.5.1 of the EIS, an aircraft crash into a nondegraded concrete storage module would not result in a significant release because the limiting aircraft missiles (engines and engine shafts) would not be able to penetrate the concrete modules and the storage casks. For degraded storage modules (Scenario 2), such penetration would be possible after significant degradation occurred. Section K.2.5.1 evaluates this scenario and provides a reference for details of the accident analysis, including estimated consequences.

9.2 (8495)
Comment - EIS000817 / 0157
P. 7-31. This airplane crash postulated accident -- what kind of airplane? How much airplane fuel in the fire? What kind of cask? One with flammable materials in it? These variables need more site specific evaluation. I have always been very concerned about the simplified analysis of airplane crashes into a full cask array -- it needs more evaluation. It is one of the big concerns. Seems to me several casks analyze only the fuel from the transporter in their fire analysis -- a plane with full fuel load should be analyzed for a cask design.

Response
Section K.2.5.1 of the EIS and the references cited in that section contain details about the postulated airplane crash onto dry storage modules. The jet selected for the crash analysis would be a midsize commercial jet with a significant fuel load. The analysis assumed that the storage array would be 100 concrete modules, each containing a typical steel storage cask with 24 pressurized-water reactor fuel assemblies. It also assumed there would be no flammable materials in the casks because DOE would not use the casks to store such materials. Based on the spacing of the storage modules and the size of the aircraft, the analysis assumed that the crash would destroy two full casks and release all the pellets from the fuel rods in the assemblies. The jet fuel from the aircraft would burn and oxidize the exposed fuel pellets into a powder. The analysis predicted the release and dispersal of a fraction of the powder to the environment. It computed impacts from the released material for a high-population site and a low-population site, including doses to human receptors as far as 80 kilometers (50 miles) from the release point. Section K.3.2.1 describes the consequences of the accident.

9.2 (11950)
Comment - EIS000817 / 0155
P. 7-21 [high-level radioactive waste storage facility figure in Section 7.2]. What are the canister supports? I'm always very interested in any supporting structures for the casks. They can be a real hazard. Basket designs and spacers can be a real problem too in drop and lift analysis -- tip-overs and surfaces the casks can hit.

Response
The canister supports in the high-level radioactive waste storage building shown in the relevant figure in Section 7.2 of the EIS would be large-diameter galvanized-steel pipe sections arranged in a grid and supported by a concrete base mat. Each pipe would hold one high-level radioactive waste canister. The space between the pipes would be filled with overlapping horizontally steel plates designed to direct most of the ventilation air through the storage cavities to remove heat generated by the waste canister.

9.3 Socioeconomics

9.3 (7985)
Comment - EIS001577 / 0005
Furthermore, the actual economic impact of the no action scenario number two, and this is basically ignoring the problem and burying the waste on site, is not elaborated upon and would include immediate short-term economic benefit to the DOE, public and the commercial utilities. This aspect of the problem, the potential unprofitability of dealing with this waste contributes to the notion that Yucca Mountain is the only answer because the utilities and waste handling contractors are already lined up at the trough like pigs. To address this problem involves huge economic subsidies by the people through their government which would employ at great expense large nuclear industry contractors to hire low cost work forces, who would then build railroads, drive trucks and engineer cask carriages to shuffle the waste around the country. The potential for local economic development in finding ways to collectively and democratically secure and isolate these wastes well into the future is great, yet the DEIS fails completely to explore it.

Response
DOE has stated that it believes that neither No-Action scenario is likely, even though continued storage of spent nuclear fuel and high-level radioactive waste would be required for some time in the future. If DOE decided not to recommend Yucca Mountain for a repository, DOE would prepare a report to Congress with recommendations for further action, including the need for new legislation in compliance with Section 113(c)(3) of the NWPA.
The future course that Congress, DOE, and the commercial nuclear power utilities could take if the Secretary of Energy did not recommend Yucca Mountain as a repository site is uncertain. The continued storage scenarios analyzed in the EIS, although reasonable for analytical purposes, do not necessarily represent a likely action. Therefore, DOE believes that Congress, DOE, and the commercial utilities would identify a permanent disposal solution even if the Secretary of Energy did not recommend the Yucca Mountain site.

Section 2.1.5 of the EIS presents cost estimates for a Yucca Mountain Repository (including costs for transportation, repository development, construction, operation and monitoring, and closure). It also includes costs of waste acceptance, storage, and national transportation; Nevada transportation; program integration (quality assurance,

human resources and administration, Nuclear Regulatory Commission fees, and Nuclear Waste Technical Review Board funding); and program institutional costs (Payments-Equal-To-Taxes, benefits payments to the State of Nevada, transportation training assistance, and other financial assistance payments). Section 2.2.3 of the EIS presents cost estimates for the No-Action Alternative. DOE based these estimates on the best available data and standard cost estimating techniques.

DOE developed these estimates for comparative purposes and to aid decision-makers in discriminating between the No-Action Alternative and the Proposed Action discussed in the EIS. The estimates do not include costs before early 2002, when DOE anticipates a decision on repository development, or the costs for siting and characterization of Yucca Mountain. The No-Action estimate includes only costs that differ from those of the Proposed Action estimate. For example, it does not include storage costs until 2010 when a repository would first accept spent nuclear fuel and high-level radioactive waste because storage would be necessary until then under both the Proposed Action and the No-Action Alternative. The No-Action estimate is based on, and consistent with, industry experience for dry storage of spent nuclear fuel and high-level radioactive waste.

Concerning economics, the costs associated with the Proposed Action would be greater during the first 100 years; the ongoing costs associated with continued storage under the institutional control scenario would be far greater. Most of the funding for repository investigation and ultimately development, should the project proceed to that stage, would come from commercial utilities and their ratepayers who benefit directly from the use of nuclear power. Continued storage of spent nuclear fuel at generator sites would also be ratepayer-funded. The analysis assumed that continued storage facilities would require replacement every 100 years, and there would be a major facility repair halfway through the first 100-year cycle. Under Scenario 2, loss of institutional control, the projected economic impacts would be the same as those for Scenario 1 for the first 100 years, but after that approximately 800 jobs would be lost.

9.4 Human Health and Safety

9.4 (1537)
Comment - EIS000456 / 0002
We didn't ask for this nuclear neighbor. The plant was forced on us more than 30 years ago. In 1994, the utility company was given permission to build a pad to hold up to 48 casks on Prairie Island. As of today, they have 17 casks sitting and they will need, I think, three or four more to reach the year 2012 when they are going to go for their relicensing.

Today we face a real threat that how it's been called a temporary storage facility while in fact its permanent. Our children, our children's children will be forced to live with this, which to us is a very real health and safety threat.

Response
The Nuclear Regulatory Commission has stated, "The overall conclusion for on-site storage of spent fuel during the term of a renewed license is that the environmental impacts will be small for each plant" (DIRS 101899-NRC 1996). Although this finding is applicable only to the continued storage of existing spent nuclear fuel and spent nuclear fuel generated during the 20-year license renewal period for the nuclear powerplant, for purposes of analysis, DOE assumed that potential environmental and radiological impacts for the storage facility would remain small for much longer periods assuming effective institutional controls are maintained. Environmental impacts would remain small because no additional fuel would be generated beyond the operation of the nuclear powerplant (plants are assumed to be closed after the first 20-year license renewal period), and radiological impacts would remain within regulatory limits specified in the storage facility license (10 CFR Part 172).

9.4 (6136)
Comment - EIS001654 / 0038
Page S-65. The Proposed Action Poses Some Small Health Risks in the Short-term While No Action Alternatives Pose Either Far Greater Health Risks or Unimaginable Financial Costs Based on S.11.3.

The impacts can be summarized as follows:

Impact Type	Proposed Action	No-Action Scenario 1	No-Action Scenario 2
Socio-Economic	2,400 jobs	Jobs lost	Jobs lost
Health (Latent Cancer Fatalities)			
Transportation	6-28	0	0
Construction-Pre-closure	3-4	16	16
First 100 years[a]	22-50	25	25
Long-term (100-10,000yrs)	<1	15	3,300

a. Includes non-radiological fatalities in all scenarios

It would be irresponsible to suggest that the Scenario 2 No-Action Alternative is acceptable in terms of long-term public health. Further, it does not fulfill the objective of the Nuclear Waste Policy Act, namely that it not only does not provide for geologic disposal of nuclear waste, it also does not isolate the waste from the environment.

Response
DOE agrees that the No-Action Alternative fails to fulfill the objectives of the NWPA to develop a repository for the disposal of spent nuclear fuel and high-level radioactive waste. The No-Action Alternative provides a basis for comparison of the potential environmental impacts of no action with those of the Proposed Action.

9.4 (9873)
Comment - EIS002150 / 0002
Has the department figured out how many latent cancer deaths there will be if the future waste is left in storage on-site? Why is it necessary to drag it across the country and put so many Americans at risk?

Response
Congress enacted the Nuclear Waste Policy Act of 1982, which acknowledges the Federal Government's responsibility to provide permanent disposal of the Nation's spent nuclear fuel and high-level radioactive waste. In 1987, Congress significantly amended the Act to identify Yucca Mountain as the only site to be studied as a potential location for a geologic repository. The NWPA establishes a process leading to a decision by the Secretary of Energy on whether to recommend that the President approve Yucca Mountain for development of a geologic repository. The NWPA requires that DOE submit a Final EIS along with any site recommendation to the President of the United States. The purpose of the EIS is to provide information on the potential environmental impacts that could result from the Proposed Action and provide a basis for comparison in the two No-Action scenarios.

In Chapter 7 of the EIS, DOE evaluated potential human health impacts that could result from continued long-term storage of spent nuclear fuel and high-level radioactive waste at the generator sites. This No-Action Alternative evaluated two scenarios: long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years (Scenario 1), and long-term storage with no institutional control after approximately 100 years (Scenario 2). Although DOE does not consider either of these scenarios to be likely, they were selected for analysis because they provide a basis for comparison to the impacts of the Proposed Action. The EIS presents information about the potential radiological impacts to workers and members of the public from both No-Action scenarios, including potential latent cancer fatalities (see Chapter 7 of the EIS).

9.5 Native American Issues

9.5 (7631)
Comment - EIS001928 / 0003
While we recognize that the Nuclear Waste Policy Act prevents the DOE from considering the need for the repository or alternatives to geologic disposal, and the no-action alternative was considered to provide a baseline for comparison with the proposed action, we believe that it is necessary to point out that the No-Action alternative has serious ramifications for our Tribal community. The [Shoshone-Bannock] Tribes have consistently taken the position that the waste has remained too long in the aboriginal area of the Tribes. To even suggest that the spent fuel

will remain on site at INEEL [Idaho National Engineering and Environmental Laboratory], either with institutional controls or unimaginably, without controls, is not acceptable to our people.

As discussed in the draft EIS, if the spent fuel is left on-site in dry storage, eventually the radioactive material would escape to the environment, contaminating the atmosphere, soil, surface water and groundwater. Although there is no mention of what would happen to the people living near these sites, we assume that they would either be removed or face contamination. Such federal action as the Supreme Court succinctly stated in Lane v. Pueblo of Santa Rosa, 249 U.S. 110 (1919), "would not be an exercise of guardianship, but an act of confiscation" or "spoilation" as Justice Cardozo tartly stated in Shoshone Tribe v. United States, 299 U.S. 470, 498 (1937).

The DOE must recognize that tribal lands play a different role than in the non-Indian context. And, any federal action affecting such tribal lands must evaluate using the trust doctrine. First, the Tribal land base is the sine quo non of tribal sovereignty. Surrounded by a majority non-Indian society of a vastly different orientation, a distinct tribal territory remains essential to fulfilling the federal promise of native separatism envisioned in the treaty-making era. The vast cessions of land by tribal peoples through the treaty process were premised on federal promises that native people could continue their way of life on homelands of smaller size, free from intrusions of the majority society. The dominant tenet which emerges from these origins is that the Indians' best interests lie in preserving the tribes' sovereign nation status, resisting assimilation forces, and preserving homelands. Today, most fundamentally, the modern form of the trust obligation is the federal government's duty to protect this separatism by protecting tribal lands, resources and way of life, and shielding Indian lands from environmental threats. See e.g., United States v. Creek Nation, 295 U.S. 103, 110 (1935); Northern Arapahoe Tribe v. Hodel, 808 F.2d 741, 750 (10th Cir. 1987) (finding trust responsibility to protect tribe's wildlife resources); Joint Passamaquoddy Tribal Council v. Morton, 528 F.2d 370, 379 (1st Cir. 1975) (noting that the federal government's fiduciary duty to protect tribal lands is "beyond question"); Northern Cheyenne Tribe v. Hodel, 12 Indian L. Rep. 3065, 3070 9D.Mont, May 28, 1985) (mem.) (noting trust duty extends to off-reservation federal activities that impact tribes).

Second, intergenerational habitation is unquestionably a dominant feature of tribal land tenure. We have no intention of leaving our permanent homeland, land that was reserved by Treaty for present and future generations. The Tribes have justifiable expectations of a perpetual and stable land base. This stands in marked contrast to non-Indian owned lands, which [are] typically held by individuals for transitory habitation or business for investment.

Third, Indian land is essentially irreplaceable. This is due in part to the unavailability of alternate consolidated tracts of land, but also these lands form the basis for cultural and economic survival of the Tribes. Loss of a tribal land base because of contamination would be devastating to tribes and would lead to irreversible cultural extinction for some tribes. Moreover, if tribal lands are contaminated and damaged, habitation is restricted or eliminated which will result in the tribe losing its political powers to control and regulate the activities occurring on its homelands. Finally, the tribe may be unable to adequately preserve or protect its members' general health, welfare and safety through the loss of contaminated lands.

The concept of a secure usable tribal homeland for future generations must guide the trust analysis in the DOE's decisionmaking regarding the no-action alternative. Accordingly, relocating a tribe in a manner similar to the relocation of the non-Indian residents of Times Beach or Love Canal would be disastrous to the Tribe's well being, and inconsistent with the federal government' trust obligations to the tribe. See, e.g., Continental Insurance Co. v. Northeastern Pharmaceutical & Chem. Co., Inc., 811 F.2d 1180, 1182 n.1 (8th Cir. 1987) (noting high levels of the hazardous substance dioxin resulted in the government purchasing the entire town of Times Beach, Missouri with its population of approximately 2,200 people for $37 million); Smith v. Reagan, 842 F.2d 28 (2d Cir. 1988) (residents of Love Canal, New York received relocation assistance when 21,000 tons of chemical waste dumped by Hooker Chemical & Plastics Corp. in the Love Canal landfill leaked out and made many residences uninhabitable).

Response

The purpose of the EIS is to provide information on the potential environmental impacts that could result from the Proposed Action to construct, operate and monitor, and eventually close a repository for the disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain. DOE analyzed the No-Action alternative to serve as a basis for comparing the magnitude of potential environmental impacts of the Proposed Action. In making a determination on whether to recommend Yucca Mountain, the Secretary will consider not only the potential environmental impacts identified in the EIS, but other factors such as technology, economics, and national policy.

DOE acknowledges the Federal Government's trust responsibilities to Native Americans, but analysis of these obligations or issues associated with securing tribal homelands for future generations is beyond the scope of this EIS. If the Yucca Mountain site was not approved, DOE would not proceed with the development of a repository there and, as directed by Section 113(c)(3) of the NWPA, would prepare a report to Congress with its recommendations for further action to ensure the safe permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. DOE has stated that it believes that both No-Action Alternative scenarios are unlikely even though continued onsite storage of high-level radioactive waste and spent nuclear fuel would be necessary for some time in the event that the Yucca Mountain site was not approved.

REFERENCES

101798	DOE 1994	DOE (U.S. Department of Energy) 1994. Greater-Than-Class C Low-Level Radioactive Waste Characterization: Estimated Volumes, Radionuclide Activities, and Other Characteristics. DOE/LLW-114, Rev. 1. Idaho Falls, Idaho: U.S. Department of Energy. TIC: 231330.
103191	DOE 1994	DOE (U.S. Department of Energy) 1994. Final Supplemental Environmental Impact Statement, Defense Waste Processing Facility. DOE/EIS-0082-S. Aiken, South Carolina: U.S. Department of Energy. TIC: 243608.
101802	DOE 1995	DOE (U.S. Department of Energy) 1995. Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement. DOE/EIS-0203-F. Idaho Falls, Idaho: U.S. Department of Energy, Idaho Operations Office. TIC: 216020.
101811	DOE 1996	DOE (U.S. Department of Energy) 1996. Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada. DOE/EIS 0243. Las Vegas, Nevada: U.S. Department of Energy, Nevada Operations Office. TIC: 239895.
103213	DOE 1996	DOE (U.S. Department of Energy) 1996. *Addendum (Final Environmental Impact Statement), Management of Spent Nuclear Fuel from the K-Basins at the Hanford Site, Richland,* Long Info Washington: DOE/EIS-0245F. Richland Washington: U.S. Department of Energy. TIC: 243958.
103214	DOE 1996	DOE (U.S. Department of Energy) 1996. Tank Waste Remediation System, Hanford Site, Richland, Washington, Final Environmental Impact Statement. DOE/EIS-0189. Richland, Washington: U.S. Department of Energy. TIC: 226909.
101816	DOE 1997	DOE (U.S. Department of Energy) 1996. *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste*. DOE/EIS-0200-F. Summary and five volumes. Washington, D.C.: U.S. Department of Energy, Office of Environmental Management. TIC: 232988.
101779	DOE 1998	DOE (U.S. Department of Energy) 1998. Viability Assessment of a Repository at Yucca Mountain. DOE/RW-0508. Overview and five volumes. Washington, D.C.: U.S. Department of Energy, Office of Civilian Radioactive Waste Management. ACC: MOL.19981007.0027; MOL.19981007.0028; MOL.19981007.0029; MOL.19981007.0030; MOL.19981007.0031; MOL.19981007.0032.